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REPORT ON THE PROGRESS OF BROADCASTING IN INDIA

Up to the 31st March 1939.

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English Book Store, Abbottabad, N.-W. F. P.
Faqir Chand Marwah, Peshawar Cantt.
Higginbothams, Madras.
Hindu Library, 137/F, Balaram De Street, Calcutta
H L, College of Commerce, Co-operative Stores, Ltd, Ahmedabad.
Hyderabad Book Depot, Chaderghat, Hyderabad (Deccan).
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Imperial Publishing Coy., Lahore.
Indian Army Book Depot, Dayalbagh, Agra.
Indian Army Book Depot, Daryaganj, Delhi.
Indian School Supply Depot, Central Avenue South, P. O. Dharamtala, Calcutta.
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Lahiri & Co., Ltd, Calcutta, Messrs. S. K.
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Malhotra & Co., Post Box No. 94, Lahore, Messrs. U. P.
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University Book Agency, Kacheri Road, Lahore.
Upper India Publishing House, Ltd., Literature Palace, Ammuddaula Park, Lucknow.
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Wheeler & Co., Allahabad, Calcutta and Bombay, Messrs. A. H.
Young Man & Co. (Regd.), Egerton Road, Delhi.

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GOVERNMENT OF INDIA.

OFFICE OF THE CONTROLLER OF BROADCASTING.

No. F. 12 (1)-A|39.

Dated New Delhi, the 3rd June 1939.

FROM

LIONEL FIELDEN, Esq.,
Controller of Broadcasting,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
DEPARTMENT OF COMMUNICATIONS,
SIMLA.

SUBJECT :—*Publication of an Annual Report on the working of All India Radio.*

SIR,

I have the honour to submit herewith a report on the activities of All India Radio, extending to March 31, 1939. Since no separate report on Indian Broadcasting has previously been issued, I have taken the opportunity of including a historical survey of the development of Broadcasting in India.

I have the honour to be,
SIR,
Your most obedient servant,

LIONEL FIELDEN,

Controller of Broadcasting.

INTRODUCTORY NOTE.

For the information of foreign readers of this report, who are unaccustomed to the use of Indian currency and units, it may be mentioned that a lakh is one hundred thousand and is usually written 1,00,000.

A rupee is equal to approximately £0-1-6 at par ; a lakh of rupees is equal to £7,500.

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ALL INDIA RADIO ADDRESSES.

(i) Headquarters.

No. 1, Bhagwan Das Road, New Delhi.

	Administration and Programme Division	Engineering Division.
Telegrams	CONBROCAST (New Delhi)	CEBROCAST (New Delhi).
Telephones	8082 or 8056	8079 or 8004

(ii) Stations.

			Telegrams	Telephones: Administration and Programme Division.	Telephones: Engineering Division.
1	Delhi	18, Alipore Road (Studios). 4, Underhill Road, (Offices).	AIRVOICE (Delhi)	5411	5412
2	Bombay	Central Govt buildings, Queen's Road.	AIRVOICE (Bombay).	34013	42702
3	Calcutta	1, Garstins Place	AIRVOICE (Calcutta)	818 Regent	817 Regent.
4	Madras	"Eastnook" Marshals Rd., Egmore	AIRVOICE (Madras)	8561	86025
5	Lahore	39, Empress Road	AIRVOICE (Lahore)	4778	4813
6	Lucknow	18, Abbot Road	AIRVOICE (Lucknow)	272	684
7	Trichinopoly	8, Williams Road	AIRVOICE (Trichinopoly)	127	126
8	Dacca	62, Sir Nazimuddin Rd	AIRVOICE (Dacca).	246	248
9	Peshawar	Civil Secretariat	AIRVOICE (Peshawar).	289	379

(iii) Subordinate Offices.

				Telephones.
1	News Editor, AIR.	15, Alipore Road, Delhi.	AIRNEWS (Delhi).	6112
2	Editor, INDIAN LISTENER.	1, Bhagwan Das Rd. New Delhi	LISTENER (New Delhi)	8071
3	Research Engineer, AIR.	10, Underhill Lane, Delhi.	AIRSEARCH (Delhi).	5943 and 7045
4	Installation Engineer, AIR.	Do.	AIRWORKS (Delhi).	5915

1931	Nov. 23 ..	Government agreed to carry on Broadcasting for an interim period.
	Dec. 31	Licences in force—8,056
1932	May 5 .	It was definitely decided to continue the Indian State Broadcasting Service under State management.
	Dec. 19 ..	The British Broadcasting Corporation began regular Broadcasting Service to the Empire.
	Dec. 31 .	Licences in force—8,557.
1933	Dec. 31	Licences in force—10,872.
1934	Jan. 1 .	The Indian Wireless Telegraphy Act, 1933, brought into force.
	Jan. ..	The Government of India granted Rs. 2½ lakhs for the establishment of a station at Delhi.
	Feb. ..	The Government of Madras secured the services of Mr. V. A M. Bulow of the British Broadcasting Corporation to draw up a scheme of broadcasting for the Madras Presidency.
	Dec. 31 .	Licences in force—16,179.
1935	Jan. ..	The Marconi Company offered to the Government of the N. W. F. P. the loan of a transmitter and a number of community receivers for village broadcasting in the N. W. F P.
	Jan ..	Transmitter for the Delhi Station ordered from the Marconi Co. by the Government of India.
	Mar. 1 ..	A separate office of the Controller of Broadcasting created under the control of the Department of Industries and Labour of the Government of India.
	Mar. ..	Government allotted a special fund of Rs. 20 lakhs for the development of Broadcasting.
	Aug. 30 ..	Mr. Lionel Fielden assumed charge as the first Controller of Broadcasting of the Government of India.
	Sep. 10 ..	Opening of the "Akashvani" Broadcasting Station at Mysore.
	Dec. 22 ..	The "Indian Radio Times" was renamed the "Indian Listener" and appeared in a new format.
	Dec. 31 ..	Licences in force—24,839.
1936	Jan. 1 ..	The Delhi Station of the Indian State Broadcasting Service began transmissions (20 K.W. Medium-wave—**3rd transmitter**).
		Radio Journal of the Indian State Broadcasting Service "Awaz" in Urdu and Hindi published from the Delhi Station.
	Jan. ..	A further grant of Rs. 20 lakhs for the development of Broadcasting added, making a total of Rs. 40 lakhs

1936	Jan. 23	.	Mr. H L. Kirke of the British Broadcasting Corporation arrived in India to report on a scheme of expansion of broadcasting in India.
	April 6	.	The Dehra Dun Broadcasting Station commenced broadcasting.
	June 8	.	Designation of the Indian State Broadcasting Service changed to "All India Radio".
	June	.	Rural Broadcasts inaugurated from the Delhi Station.
	Aug. 1		AIR admitted as a regular Associate Member of the Union Internationale de Radiodiffusion, Geneva.
	Aug. 19		Mr. C. W. Goyder of the British Broadcasting Corporation assumed charge as the first Chief Engineer of All India Radio.
	Aug. 21	..	The Government of India established an Advisory Council for the Delhi Station consisting of 14 members.
	Dec. 19	..	Departure of the first batch of officers of AIR for training at the B.B.C.
	Dec.		A questionnaire issued to 1,500 licence holders in the Delhi area.
	Dec. 31	..	Licences in force—37,797.
1937	Jan.	..	Creation of an Installation Department of AIR.
	Jan. 29	..	First Station Directors' Conference at Delhi.
	Apr. 1	.	A separate Research Department of All India Radio created.
	Apr. 1	.	The Peshawar Station taken over by the Government of India from the Government of the N. W. F. P. (0·25 K.W. Mediumwave—**4th transmitter**).
	Aug.	..	Transfer of the Indian Listener from Bombay to New Delhi.
	Aug. 12	..	Second Station Directors' Conference at Delhi.
	Sep. 1	..	The Lahore Y.M.C.A. Broadcasting Station closed down.
	Sep. 9	..	Mr. Charles Barns took charge as News Editor, All India Radio.
	Dec.	.	Third Station Directors' Conference at Lahore.
	Dec. 16	..	The Lahore Station opened by H. E. Sir Herbert Emerson, Governor of the Punjab (5 K.W. Mediumwave—**5th transmitter**).
			The Delhi Shortwave Station (first) opened by Sir Thomas Stewart, Member of Council in charge of Communications (10 K.W. Shortwave—**6th transmitter**).
	Dec. 31	..	Licences in force—50.680.

1938	Feb. 4	..	The Bombay Shortwave Station opened by H. E. Sir Roger Lumley, Governor of Bombay (10 K.W. Shortwave—**7th transmitter**).
	Feb.	..	Fourth Station Directors' Conference at Calcutta.
	Apr. 2	..	The Lucknow Station opened by H. E. Sir Harry Haig, Governor of the United Provinces (5 K.W. Mediumwave—**8th transmitter**).
	Apr.	..	Fifth Station Directors' Conference at Lucknow.
	May	..	A questionnaire issued to 17,000 listeners in the Bombay Presidency.
	May 10	..	The Dehra Dun Broadcasting Association closed down owing to lack of funds.
	June 1	..	The Delhi Shortwave Station (second) began transmissions (5 K.W. Shortwave—**9th transmitter**).
	June 16	..	The Madras Station opened by H. E. Lord Erskine, Governor of Madras (0·25 K.W. Mediumwave—**10th transmitter** and 10 K.W. Shortwave—**11th transmitter**).
			The Madras Corporation Broadcasting Service ceased to function.
			First issue of "Vanoli" in Tamil and "Vani" in Telugu published from Madras.
	July 1	..	The "Awaz" bifurcated into "Awaz" in Urdu, and "Sarang" in Hindi.
			Sixth Station Directors' Conference at Bombay.
	Aug. 16	..	The Calcutta Shortwave Station opened by H. E. Sir Robert Reid, Governor of Bengal (10 K.W. Shortwave—**12th transmitter**).
	Aug. 22	..	An agreement with the Indian Phonographic Industry entered into, for the supply of disc records to the Stations of All India Radio.
	Oct. 3	..	Inauguration of School Broadcasting as a regular feature. First set of School Broadcast Pamphlets printed for the Delhi, Bombay, Calcutta and Madras Stations.
	Oct. 16	..	The Delhi Province Rural Broadcasting Scheme inaugurated by The Hon'ble Mr. E. M. Jenkins, Chief Commissioner, Delhi Province, Delhi.
	Nov. 1	..	Rural Broadcasting inaugurated from the Madras Station.
	Nov.	..	Seventh Station Directors' Conference at Delhi.
	Dec. 31	..	Licences in force—64,480.

1939 Jan. 16	..	The first organised Anti-Piracy Drive inaugurated throughout India.
Jan. 18	..	First Inter-Station relays begin. Delhi relays Bombay on Wednesdays and Bombay relays Delhi on Saturdays.
Jan. 25	..	H. E. Lord Linlithgow, Viceroy of India paid a visit to the Bombay Studios.
Feb. 3	..	H. E. Lord Erskine, Governor of Madras paid a visit to the Madras Studios.
Mar. 1	..	Conversion of the Peshawar Station into a Relay Centre.
Apr. 10	..	Establishment of Advisory Committees for the Madras and Calcutta Stations.
May 1	..	H. H. the Gaekwar of Baroda laid the foundation stone of the Baroda Broadcasting Station.
May 4	..	Eighth Station Directors' Conference at Bombay.
May 16	..	The Trichinopoly Station opened by H. E. Lord Erskine, Governor of Madras (5 K.W. Mediumwave—**13th transmitter**).
July 1	..	Inauguration of Rural Broadcasts from the Lucknow Station.
Aug. 28	..	Establishment of a new Advisory Committee for the Delhi Station.
Sep. 5	..	The Madras Station starts morning and afternoon transmissions.
Oct. 1	..	Transmissions from all stations increased from 50¾ to 70¼ hours per day.
		All India Radio begins to give News Bulletins in five Indian languages (Tamil, Telugu, Gujerati, Marathi and Pushto) in addition to the usual bulletins in English, Hindustani and Bengali, totalling 27 bulletins a day.
Nov. 2	..	Broadcasts for Colleges inaugurated at Madras.
Nov. 5	..	H. E. the Viceroy, Lord Linlithgow broadcast a speech on the constitutional crisis in the provinces.
Nov. 20	..	Ninth Station Directors' Conference at Delhi.
Dec. 4	..	Inauguration of news service in Persian from Delhi.
Dec. 7	..	Establishment of an Advisory Committee for the Bombay Station.
Dec. 16	..	The Dacca Station opened by H. E. Sir John Herbert, Governor of Bengal (5 K.W. Mediumwave—**14th transmitter**).
Dec. 31	..	Licences in force—92,782.

CHAPTER I.

EARLY HISTORY.

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EARLY HISTORY.

1. "India offers special opportunities for the development of broadcasting. Its distances and wide spaces alone make it a promising field. In India's remote villages there are many who, after the day's work is done, find time hang heavily enough upon their hands, and there must be many officials and others whose duties carry them into out-of-the-way places, where they crave for the company of their friends and the solace of human companionship There are of course, too, in many households, those whom social custom debars from taking part in recreation outside their own homes. To all these and many more broadcasting will be a blessing and a boon of real value. Both for entertainment and for education its possibilities are great, and as yet we perhaps scarcely realise how great they are. Broadcasting in India is to-day in its infancy, but I have little doubt that, before many years are past, the numbers of its audience will have increased tenfold, and that this new application of science will have its devotees in every part of India."

2. With these words, spoken by Lord Irwin, then Viceroy of India, at the inauguration of the Bombay Station of the Indian Broadcasting Company, on July 23rd, 1927, began the history of regular broadcasting in India. Before this date a number of amateur radio associations had been permitted to broadcast on very low power in various parts of India and had been granted a proportion of the licence fees. It was not, however, until 1926 that the idea of a regular service took shape in the form of an agreement between the Government of India and the Indian Broadcasting Company Limited, under which a licence for the construction of two stations at Bombay and Calcutta respectively, was granted. The Bombay Station was inaugurated on July 23rd, 1927 and the Calcutta Station on August 26th of the same year. The power of these Stations was 1.5 K.W.* and their effective range about 30 miles.

3. The words spoken by Lord Irwin can be, and indeed are, spoken today with equal truth. The number of licensed listeners in India at the time when he spoke was less than 1,000. By the end of 1927 the number had reached 3,594 and by the end of 1928 the total was 6,152. If this pace of increase had been maintained, it might have appeared fairly satisfactory, particularly in view of the fact that so small a radius was covered by the two Stations. But from 1929 the curve of increase began to flatten. The end of 1929 gave a total of 7,775 and at the end of 1930 the total had actually fallen to 7,719. For the next two years the increase remained negligible and even at the end of 1932 the total number of licence holders was only 8,557.

4. In 1932-33, however, there was a sudden improvement, the total at the end of 1933 being 10,872 and at the end of 1934, 16.179. During the period 1932-34, there was no appreciable difference in the output or quality of the programmes radiated by the Bombay and Calcutta Stations, nor was there any increase in their range. The sudden increase from

*Power in this case is estimated on the basis of rating accepted at present, *i.e.*, the output from the transmitter.

8,000 to 16,000 licences during this period, must, therefore, be attributed to another factor, namely, the opening of the B. B. C's Empire Service in 1932 (December 19) and the consequent purchase of sets by a large number of Europeans in India From 1934 onwards, when talk of the further development of broadcasting began to be in the air, the pace of increase accelerated still more ; the total reaching 25,000 at the end of 1935, 38,000 at the end of 1936 and 50,000 at the end of 1937. It will be observed, however, that by the end of 1937 the curve of increase was once again beginning to flatten, the increase over the 3 years 1935, 1936, 1937 being 9,000, 13,000 and 12,000 respectively. This may be attributed to various causes, but it is satisfactory to note that by the end of 1938, the number of licences had reached 64,000, and the increase during that year was therefore 14,000. By the end of April 1939, the total had increased to 74,000 and it was clear that the establishment of new stations was beginning to show results.

5. The Indian Broadcasting Company, started in 1927, had an authorized capital of 15 lakhs, but shares of the value of 6 lakhs only were issued and were fully paid up. Of this about 4½ lakhs were spent immediately on the installation of the two Stations and other preliminary expenses. The revenue of the Company was to consist of—

(a) 80 per cent. of the licence fees charged by Government at the rate of Rs 10 per annum per licence ; and

(b) a " tribute " of 10 per cent. of the invoiced value of imported wireless receiving apparatus which was to be collected by the Company itself from the dealers.

6. After meeting the initial cost of installation, the Company was left with a reserve of only a little over 1½ lakhs of rupees. The monthly expenditure was about Rs. 33 000 and, as may be seen from paragraph 3, the number of licences fell very far short of the number which would have been required to meet such expenditure. The excess of expenditure over receipts had, therefore, to be met from the balance of capital, supplemented by a loan from the Indian Radio Telegraph Company on mortgage of the capital assets. Even so, it very soon became clear that it would be a long time before receipts were likely to cover expenditure and the Company's difficulties were further enhanced by—as the Company believed—the evasion of payment of licence fees and its inability to enforce the payment of the " tribute ".

7. In order to solve these two problems the Company approached the Government of India, but the latter were not convinced that piracy existed to any appreciable extent or that importers were trying to deprive the Company of its legitimate dues. In the meantime, in order to keep the service running, the loan from the Indian Radio Telegraph Company, referred to above, was negotiated and at the same time the monthly expenditure was reduced to Rs. 24,000. The deterioration in the increase of licences in 1929, however, made it clear that the financial future of the Company was far from satisfactory and that a wide gap between receipts and expenditure was likely to continue for some time to come. In these circumstances the Government of India were approached for direct monetary assistance The Government, however, could not see their way to offer any kind of assistance, financial or otherwise. This decision was communicated to the Board of Directors at the end of January 1930. The prospects of the company were, therefore, anything but rosy, and since the

loan advanced by the Indian Radio Telegraph Company had already reached the figure of 3 lakhs, the Directors advised the shareholders to wind up the Company at once. The Indian Broadcasting Company thus decided on February 16th, 1930 to go into liquidation with effect from March 1st, 1930.

8 It seemed, therefore, that broadcasting in India had failed. It was difficult then, and it is difficult today, to account for so absolute a failure at a time when broadcasting in other countries was progressing by leaps and bounds and appeared to present no difficulties

9. The failure may, perhaps, be ascribed to four main reasons which in part still hold good today. The Company was, in the first place, undoubtedly under-capitalised In other countries the rate of increase in licence fees had been so rapid that increasing funds had been readily available to build up and improve the broadcasting service with great rapidity in the early stages and so to form an ever widening circle of listeners In India the direct opposite had been the case. The capital reserve and the revenue had been insufficient from the start and the economies made almost immediately in staff and programme funds—at a time when increased staff and increased programme funds were absolutely essential in order to attract listeners—were a fatal step. Secondly, the very high prices of receiving sets—about Rs 500 for a four valve set—were a formidable deterrent. Thirdly, it may perhaps be said—although this did not apply as acutely in Bombay and Calcutta as in other parts of India—that Indian conditions and traditions were by no means as favourable to the rapid growth of broadcasting as those of the West. In the West broadcasting was a convenient channel for an already established tradition of concerts, theatres, lectures and news ; whereas in India, public interest in all these activities was apathetic and severely limited. Lastly, although this was by no means a decisive factor, there was undoubtedly great difficulty in collecting both the licence fees and the " tribute ".

10. The liquidation of the Company was followed by " a universal demand for Government action in the matter. Not only were existing and prospective receiver licence holders anxious that there should be no interruption in the service, but dealers in wireless equipment throughout India, who held stocks of apparatus to the value of many lakhs of rupees, had been representing strongly to Government the injury that would be inflicted on their trade if immediate action were not taken. The Hon'ble Member in charge of the Department of Industries and Labour had recently been advised on the subject by the leaders or deputy leaders of the principal political parties in the Assembly who urged that immediate steps be taken to ensure that the service should be carried on without interruption. Government if necessary themselves taking over and continuing the service."* As a result of such representations, the Government of India finally decided to take over broadcasting on the following terms :—

(a) Government to acquire the Bombay and Calcutta stations of the Company, subject to it being possible for them to do this at a purchase price which represented no more than the actual depreciated value of the assets ;

(b) to take over the existing staff of the Company on their existing terms ;

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*Proceedings of S. F. C—27|2|30

(c) to run the concern experimentally through the Department of Industries and Labour for two years in the first instance during which the estimated expenditure was to be Rs. 2,67,000 per annum, against an anticipated revenue of Rs. 1,26,000, leaving a deficit of Rs. 1,41,000 per annum to be met from the revenues of the Government of India.

11. The detailed proposals to acquire and run broadcasting were approved by the Standing Finance Committee at its meeting on the 24th February 1930. During March 1930 the service was carried on by the liquidator of the Company at the expense of Government. With effect from the 1st April 1930 it was placed under the direct control of the Government of India in the Department of Industries and Labour under the designation of " The Indian State Broadcasting Service ". A Central Broadcasting Advisory Committee was formed to advise on matters relating to the management and development of broadcasting in India.

12. But it is to be noted that there was a progressive curtailment in programme expenditure The Indian Broadcasting Company had started in 1927 with a monthly expenditure of Rs 33,000. and in 1929, owing to financial stringency, reduced that figure to Rs 24,000. In 1930 the Government of India, on taking over the service, made still further reductions, bringing down the monthly total to Rs. 22,000. Thus, in direct contrast to other broadcasting services of the world, which were increasing their expenditure and consequently the standard of their programmes by leaps and bounds, the Indian Broadcasting Service was being forced to adopt lower and lower standards Such a policy, while possibly justified from a general financial point of view, could not have been better calculated to arrest the growth of broadcasting.

13. In 1931 the position of the Indian State Broadcasting Service was considered in connection with the general retrenchment campaign. The special attention of the Retrenchment Committee was drawn to the weight attaching to arguments in favour of the continuance of the service, especially its probable *ultimate* financial value, its educational, cultural, and nation-building possibilities, its utility (when extended) in times of national disturbance (as evidenced in Great Britain during the general strike of 1926) and the objections to the alternative of allowing small independent broadcasting organizations to spring up without adequate control. Attention was also drawn to the losses that a decision to close the service would cause to dealers and others. But in view of the urgent necessity for economy and the fact that the service was being run at a loss, Government nevertheless decided to close down the service. The Press communiqué announcing the decision was issued on the 9th October 1931.

14. The announcement caused a considerable amount of agitation, especially in Bengal, and, as in the previous year, the matter was taken up by many members of the legislature, newspapers and representative people. Representatives of interested parties were interviewed by the Hon'ble Member in charge of the Department of Industries and Labour and, after considerable hesitation, it was agreed on November 23rd, 1931, that the Government would carry on the service for an interim period during which proposals for its maintenance by private enterprise might be formulated and examined. These proposals, however, were not found satisfactory and it became evident that the service, if it were to be carried on at all, would have to be conducted by the Government itself. It was

also evident that, if severe financial losses were to be avoided, new sources of revenue would have to be found. The main, and indeed the only possible, source of such revenue seemed to be in increased import duty on wireless sets and components. The rates of customs duty then prevailing are shown in the following table :—

Duty on	Before March 1931.	From March 1931.	From Septembe 1931.
(1) Wireless valves designed exclusively for reception..	12½%	20%	25%
(2) Valves for gramophones	30 %	40%	50%
(3) Electric lamp bulbs	15 %	20%	50%
(4) Wireless receiving sets	12½%	20%	25%
(5) Electric wireless gramophones	30 %	40%	50%

These differences led to the suggestion that the customs receipts might at once be substantially increased by reclassifying both wireless receiving sets and valves intended for use in wireless reception at 50 per cent. instead of 25 per cent., and on this basis it was decided to rescind the order to close down the service and to review the whole case again. Orders were issued on the 23rd November 1931 to the Station Directors, Bombay and Calcutta, for the continuance of the service until further notice. The duty on wireless receiving apparatus was fixed at 50 per cent. with effect from the 1st April 1932 by the Indian Tariff (Wireless Broadcasting) Amendment Act, 1932. In introducing the bill for the enhanced duty in the Legislative Assembly on the 4th April 1932 Sir Joseph Bhore said :

" They (the Government of India) consider however, that the service should not be a charge upon the general taxpayer, and they accordingly propose that the import duties on wireless reception apparatus should be enhanced so as to ensure that the customs receipts associated with broadcasting may suffice to cover the cost of the service."

15. On the 5th May 1932 it was definitely decided to continue the Indian State Broadcasting Service under State management.

16. In order to obtain sufficient revenue it was clearly desirable, over and above the collection of customs duty, to ensure that licence fees also were collected. The Indian Broadcasting Company had found itself unable to do this successfully. One of the difficulties in preventing evasion was that the existing legislation—The Indian Telegraphy Act, 1885—gave control only of the establishment, maintenance and working of wireless apparatus. There was no restriction on the *possession* of wireless apparatus and it was thus impossible to obtain a conviction without proof that the apparatus had been used for reception or transmission. A bill was therefore drafted in 1932 giving powers to control the possession of wireless apparatus and this became law in the Indian Wireless Telegraphy Act, 1933. The Act was brought into force with effect from the 1st January 1934. Even so, the problem of checking evasion amongst a population so vast, and scattered over such immense distances, was not satisfactorily solved.

17. Judged at a glance by the following figures, it would seem that the application of the 50 per cent. customs duty had for the time being

solved the financial difficulties of Indian broadcasting :—

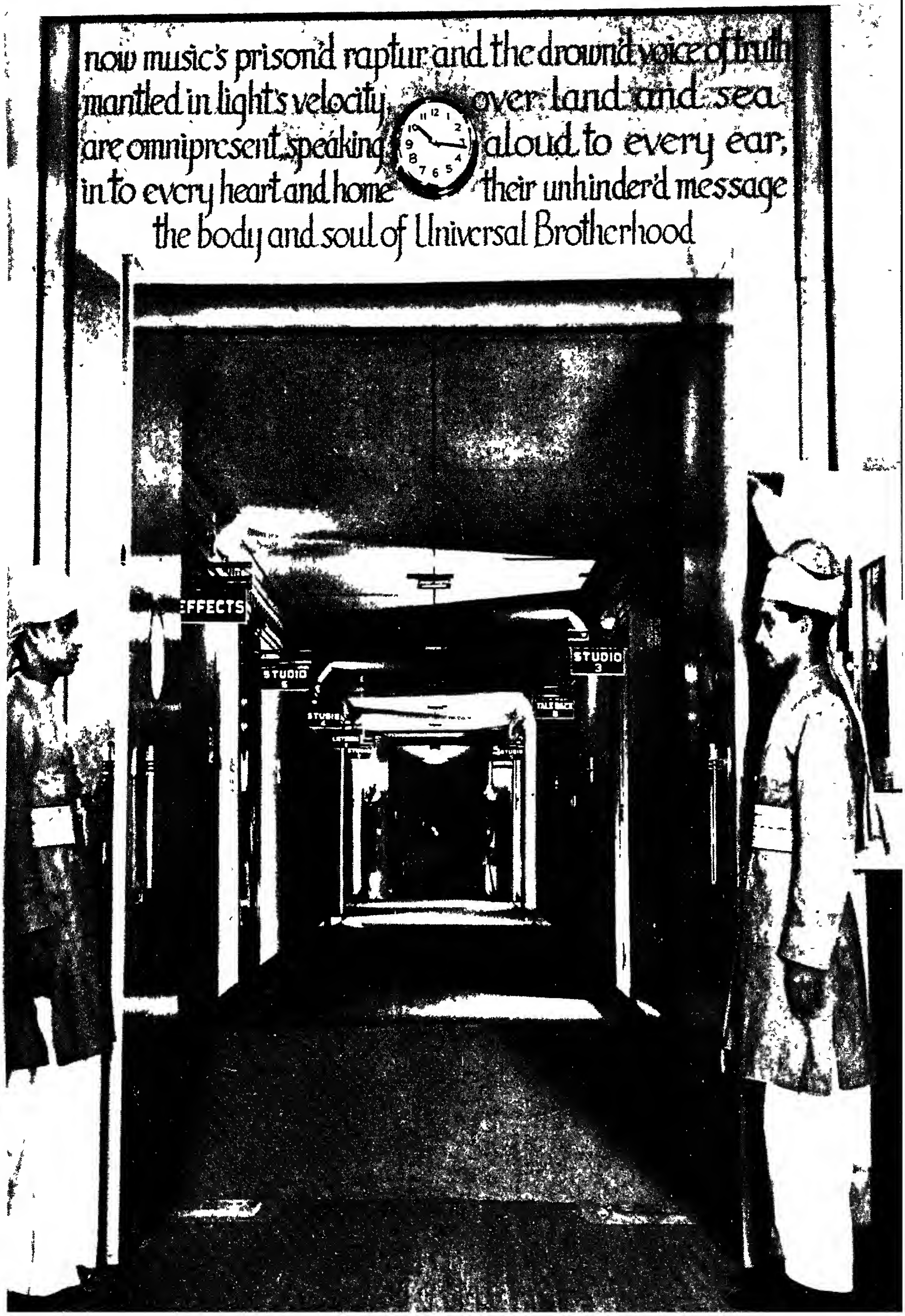
(*Figures in thousands of rupees.*)

	Total Expenditure (excluding interest, depreciation, etc.).	Revenue.			Total Revenue.
		Customs.	Licences.	Miscellaneous.	
1930-31 ..	2,79	56	67	33	1,56
1931-32 ..	2,64	1,04	66	30	2,00
1932-33 .	2,38	2,44	85	35	3,64
1933-34 ..	2,80	4,09	1,20	39	5,68
Total ..	10,61	8,13	3,38	1,37	12,88

During these four years, Indian broadcasting instead of showing a steady loss as before, had earned a profit of Rs 2,27,000, which was a good deal more than sufficient to cover the charges providing for interest on the capital outlay and depreciation of the assets

18. There was, however, something puzzling in this comparatively sudden improvement. A glance at the above figures will show that during the four years under review the expenditure had remained at a persistently low level and had even declined in 1931 and 1932. Consequently the standard of programmes, numbers of staff, and range of stations had all remained stationary at, or even below, the level which had produced stagnation and failure in 1930. It is clearly impossible to assume that such limited broadcasting from two such limited stations should have produced, for no apparent reason, a leap in the annual customs revenue from Rs. 56,000 in 1931 to Rs 4,08,000 in 1934, and we must almost certainly seek for the reason elsewhere. We have not far to go. On the 19th December 1932 the British Broadcasting Corporation started the regular transmission of programmes to the Empire and there can be little doubt that this activity was almost, if not wholly, responsible for the improved financial position of Indian broadcasting. The evidence of the above figures is further supplemented by that of the Indian Radio Times (now the Indian Listener), the circulation of which, after remaining entirely and astonishingly stagnant at 2,750 copies from April 1931 to June 1932, had jumped by the end of 1934 to 6,000 and to 12,000 by the end of 1935. During this period no new Indian station had been established nor had any improvements in the programmes of the existing stations been made.

19. To whatever cause we may ascribe the financial improvement which took place between 1930 and 1934, there can be no doubt that by the beginning of 1934 interest in broadcasting was quickening apace. This interest manifested itself in three main activities. In the first place Government felt justified in embarking on a policy of development, and as a first step a grant of Rs. 2½ lakhs was sanctioned in 1934 for the establishment of a station at Delhi, while steps were taken to recruit the services of an experienced official from the British Broadcasting Corporation The action of the Government may perhaps have been stimulated


now music's prison'd raptur and the drown'd voice of truth
mantled in light's velocity, over land and sea
are omnipresent, speaking aloud to every ear,
in to every heart and home their unhinder'd message
the body and soul of Universal Brotherhood
EFFECTS
STUDIO 3

or even spurred by that of the Government of Madras which in February 1934 secured the services of an official of the British Broadcasting Corporation, Mr. Bulow, to draw up a comprehensive scheme of broadcasting for the Madras Presidency, upon which it was proposed to spend about Rs. 40,00,000. The third activity was that of the Marconi Company which, in order to stimulate broadcasting, and especially village broadcasting, in India, offered to the Government of the N. W F. P. early in 1935 the loan of a transmitter and a number of village community receivers on the understanding that these would be purchased if after a year's trial the experiment proved a satisfactory one.

20. The transmitter for the Delhi Station was ordered by the Government of India from the Marconi Company in January 1935. It was not at that time envisaged that any large grant for the development of broadcasting would be made, and Government instructed Marconi's that the price should not exceed Rs. 3,45,000. Advice was also sought from the B.B.C. as to the range and power of the transmitter and the situation of the Station but since the price was already fixed, the B.B.C. could only reply that there was no alternative within that price to a 20KW transmitter which would give a reliable service over a radius of about 80 miles. A contract was entered into with the Marconi Co., stipulating that the station should be ready for transmission in October 1935. The limitation of price had a somewhat unfortunate effect since the sum of Rs. 3,45,000 did not prove quite sufficient to pay for a fully up-to-date 20KW station. Although the transmitter itself was satisfactory, economies had to be made in the studio equipment, *viz.*, microphones, signal lights. controls, etc. Regular transmissions were started from the Delhi station on January 1st, 1936.

21. In the meanwhile, in March 1935, the Finance Member, Sir James Grigg, allotted a special fund of Rs. 20 lakhs for the development of broadcasting. In August 1935, the new Controller of Broadcasting, Mr. Lionel Fielden, arrived in India. He was at once confronted with several difficult and urgent problems. Firstly, the station at Delhi was nearing completion and was in fact ready for test transmissions in October but no staff had been appointed and no experienced staff was available in India. Secondly, it was clearly necessary to re-organize the work of the two existing stations which in many respects was far below the required standard. Thirdly, the headquarters staff had to be recruited and trained. Fourthly, the new studios at Delhi had to be acoustically treated and prepared very rapidly. Lastly, and most important of all, the whole development scheme for the expenditure of 20 lakhs had to be worked out immediately.

22. The last point was an extremely difficult one. It was obvious that to give India anything like an adequate coverage a vastly greater sum, in the neighbourhood of 10 crores at least, would be needed and the expenditure of only 20 lakhs could not, whatever plan were adopted, provide more than a very inadequate service which was bound to give rise to criticism, not only because the greater part of India would not be properly served (as compared with European services) but also because natural jealousies would arise between the areas which were served and those which were not. There were in India no technical experts with any long experience in broadcast-engineering or in the latest developments of broadcasting Under these circumstances the Controller considered that in drawing up any plan the services of a highly qualified technical expert were most

desirable in order that the best use might be made of the limited funds. In November 1935, the British Broadcasting Corporation agreed to send out to India, free of charge, Mr. H. L. Kirke, the head of the B.B.C. Research Department. Mr. Kirke arrived in India in January 1936 and it was then understood that a further grant of 20 lakhs would be added to the broadcasting fund in the 1936 budget making a total of 40 lakhs in all.

CHAPTER II.

DEVELOPMENT SCHEME.

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23. In March 1936 the Controller of Broadcasting and Mr. Kirke made an extensive tour of India visiting Lucknow, Allahabad, Benares, Calcutta, Nagpur, Hyderabad (Deccan), Bezwada, Ellore, Rajahmundry, Madras, Madura, Trichinopoly, Bangalore, Bombay, Baroda, Ahmedabad, Peshawar and Lahore, and discussing with the local authorities in each place the various problems involved. Recommendations for the expenditure of 40 lakhs were submitted to the Government of India in May 1936 The first paragraph of the report containing these recommendations runs as follows :—

> " The Government of India has now set aside a sum of Rs. 40 lakhs for the development of Broadcasting in India. Whilst this is a considerable sum of money, it must be emphasised that it is negligible compared to the amounts spent on broadcasting in Europe. In England, for example, there are at present nine 50 kilowatt transmitters, one 100 kilowatt and four stations of 1 kilowatt and less, whilst one of 50 kilowatts and one of 100 kilowatts are in course of erection and several more small stations are projected. This involves an expenditure of well over 100 lakhs for transmitting stations alone, excluding the cost of the elaborate studios which exist in all main centres—about 13 in all. On the continent of Europe similar conditions obtain. In Europe, which may be compared with India from the point of view of size and coverage, there are over 100 high and medium power stations, representing a total cost of the order of 10 crores of rupees The area of the British Isles is about 60,000 square miles, while that of India is nearly two million square miles. The population of the British Isles is roughly 46,000,000 while that of India is more than 350,000,000. From this it is clear that the service which can be given to India for a sum of 40 lakhs will be very poor compared with that given in England."

24. The recommendations envisaged the establishment of seven mediumwave stations (in addition to the existing mediumwave stations at Delhi, Calcutta and Bombay), one shortwave station (at Delhi) for the transmission of news from a central point, and the purchase of the existing small mediumwave station at Peshawar. It was further proposed that one mediumwave station of 100 KW. power, five stations of 5 KW. power, and two stations of 2 KW. power should be established in various centres. This scheme, together with the modifications and improvements which were necessary at Bombay and Calcutta involved the expenditure of Rs. 40,19,000 with a recurrent annual expenditure rising to Rs. 26 lakhs when the scheme was complete.

25. Since there were no data available on reception conditions in India at various times of the year, it was impossible to make any exact estimate of the areas which would be adequately served. It was, however, estimated that the scheme would provide an 'A' service area giving a signal strength of 10 millivolts per metre to approximately 14 million

people and a ' B ' service area with a signal strength of 3 millivolts per metre to about 35 million people. In the light of the experience gained by All India Radio since 1935, it will be seen that this was an optimistic forecast. Although during the winter months conditions are good and a signal strength of 3 millivolts per metre serving a ' B ' area as envisaged by Mr. Kirke is adequate, it has been found that during the summer months a signal strength of about 20 millivolts per metre is often needed to overcome the severe atmospheric disturbances, so that even the ' A ' areas would not at certain times of the year serve as many people as Mr. Kirke had calculated. The report also stressed the necessity of setting up a Research Department to undertake the essential work of field strength measurements, transmission tests, the collection of information regarding atmospheric disturbances, the recording of programmes, the development of radio links, and general advice on the purchase of new apparatus.

26. In addition, the report took into account the question of the appointment of a Chief Engineer and in this connection Mr. Kirke wrote as follows :—

> " I understand that it has already been decided in principle that the policy originally followed of controlling the technical staff of the Indian State Broadcasting Service from the Posts and Telegraphs Department is to be discontinued, and a separate technical organization established within the Indian State Broadcasting Service. I am in entire agreement with this decision. A divided control in broadcasting is bound to lead to difficulties and is likely to impair efficiency. It is, however, essential that a Chief Engineer be appointed without delay to supervise the technical and research departments of Broadcasting and to build up a satisfactory organization, especially in view of the developments which are now contemplated.
>
> It has been proposed that an engineer from the Posts and Telegraphs Department should be seconded for duty as Chief Engineer to Broadcasting. In support of this suggestion it has been adduced that he could be replaced if necessary in case of absence or illness by other engineers of the Department. It seems to me that this proposal carries the dangerous implication that such a man might also, and indeed probably would, be replaced as and when his own promotion or the convenience of the Posts and Telegraphs Department required it. The post of Chief Engineer to a broadcasting organization is a responsible and difficult one, and the man who fills it must be a specialist. Moreover, he will have all he can do to keep abreast of developments in broadcasting and the post could not be satisfactorily filled by a series of men seconded from other branches of engineering.
>
> I have not yet found in India any man, European or Indian, who seems to me to possess the necessary qualifications and experience for this appointment. I agree that if a suitable man could be found in the Posts and Telegraphs Department and that Department would agree to transfer him permanently to

the Indian State Broadcasting Service as Chief Engineer, it would be a satisfactory solution to the difficulty. But if, as I am inclined to think, no such man is available—since on the one hand a man of long experience in the Posts and Telegraphs is not likely to be a specialist in broadcasting, and, on the other, that Department is not likely to wish, in any case, to part with their best men—then it seems to me essential to bring out a fully qualified man from England.".

27. To quote from the last paragraph of the report, the general recommendations were "based on a compromise between providing a service to urban areas, from which licence revenues may be anticipated, and providing such service to rural areas as may be offset in cost, at least to some extent, by the revenue obtained from urban areas. So long as the Indian State Broadcasting Service is regarded more or less as a commercial undertaking and not as a social service, such considerations must affect its development : but, under such conditions, rural areas of comparatively sparse population—which, it might be argued, are actually more in need of broadcasting than richer and more populous districts—are necessarily excluded from its scope. It may be thought that the idea of a self-supporting service is wrong, and that Government should devote the limited funds available to "unremunerative" stations in rural areas. There are several good reasons for holding the more mercenary view. If broadcasting is to develop as it should, the Service must have a life of its own and strength to survive budgetary fluctuations. In the early stages at least, vitality can come only from the body of sophisticated listeners who are prepared to pay for their entertainment. Generalizations about the value of rural broadcasting are not necessarily correct, and in actual life little is known at present of the rural side of broadcasting problems. It is quite arguable that if Government are prepared to devote Rs. 40 lakhs initial and Rs. 26 lakhs recurrent to Social Services in rural areas, they might find better objects of expenditure than broadcasting. But if Government allot these sums to a rationally prepared broadcasting scheme, the probability is that they will, without imposing an additional burden on the general taxpayer, provide a service both for the towns and for the villages, which has within it the seeds of development on a self-supporting basis."

28. Mr. Kirke returned to England in May 1936 and a Chief Engineer from the British Broadcasting Corporation, Mr. C. W. Goyder, was appointed on August 14th, 1936, and arrived in India at the end of that month. Mr. Goyder did not fully agree with the scheme proposed by Mr. Kirke and was of the opinion that if mediumwave transmitters only were used, it would not be possible to cover more than a small percentage of the total area of India with the funds available. It was, therefore, he thought, essential first to provide a basic shortwave service in order to give at least a *second grade* service to the whole of India and then to supplement this service with a *first grade* mediumwave service at important centres, any future funds which might become available being devoted to the extension of this mediumwave service area. In the meanwhile certain changes had also been effected in the original scheme as a result of discussions between the Government of India and local Governments. In consultation with Mr. Goyder it was decided that the original

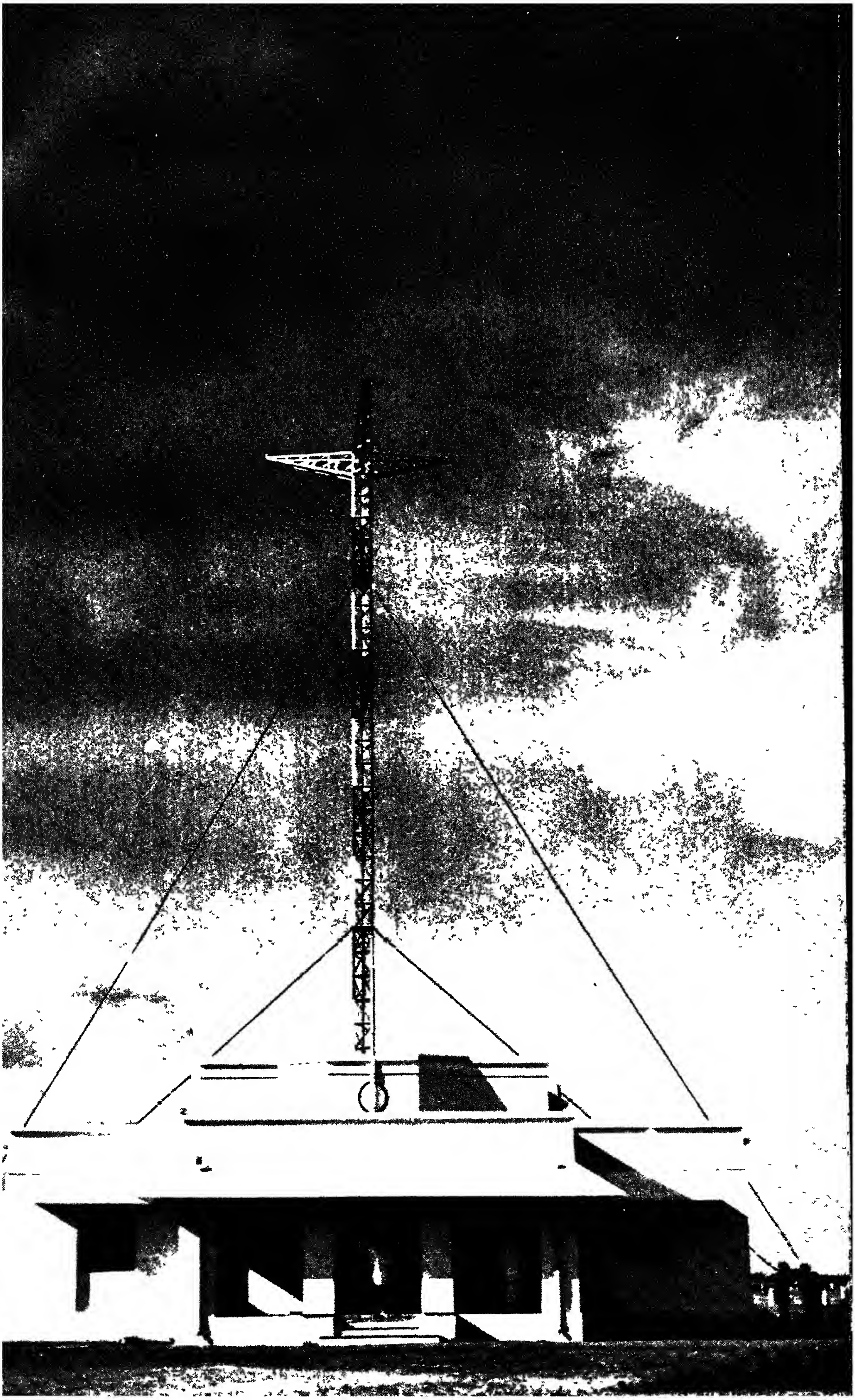
scheme should be modified as follows :—

Delhi	20 K.W.	Mediumwave (already established).
	10 K.W.	Shortwave.
	5 K.W.	Shortwave.
Bombay	1·5 K.W	Mediumwave (already established).
	10 K.W.	Shortwave.
Calcutta	1·5 K.W.	Mediumwave (already established).
	10 K.W.	Shortwave.
Madras .	·25 K.W	Mediumwave
	10 K.W	Shortwave.
Lahore .. .	5 K.W.	Mediumwave
Lucknow . .	5 K.W	Mediumwave
Dacca	5 K W.	Mediumwave.
Trichinopoly ..	5 K.W.	Mediumwave
Peshawar	·25 K.W	Mediumwave. (already established).

29. The main factors governing this modification were as follows : It was estimated that 10 K.W. shortwave stations working on a wavelength of 60 metres would each provide an intelligible, if not first rate, service under all atmospheric conditions over a range of approximately 500 miles. The four 10 K.W. transmitters, each costing about Rs. 1,35,000, could therefore be regarded as almost exactly covering the whole of India and providing a service which, if not entirely free from " fading ", would be not unsatisfactory to the average listener. It was felt that, in view both of the necessity of increasing the number of licences in order to assist further development, and also of the uncertainty regarding the availability of further funds, the provision of four such stations at a total cost of Rs. 5,40,000 would be a wiser step than the expenditure of Rs. 10 lakhs on a single large mediumwave station. Moreover, shortwave stations would provide the possibility of alternative programmes which, owing to difficulties arising from timings, languages, Indian and European music and so forth, would clearly be very desirable.

30. The new stations were ordered in January 1937 and came into operation as follows :—

Lahore	5 K.W. Mediumwave . ..	December 16, 1937.
Delhi	10 K.W. Shortwave	December 16, 1937.
Bombay	10 K.W. Shortwave	February 4, 1938
Lucknow	5 K.W. Mediumwave	April 2, 1938.
Delhi	5 K.W. Shortwave	June 1, 1938.
Madras	10 K.W. Shortwave	June 16, 1938.
Madras	·25 K.W. Mediumwave	June 16, 1938.
Calcutta	10 K.W. Shortwave	August 16, 1938.



CHAPTER III.

PROGRAMMES.

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PROGRAMMES.

SECTION 1.

Introductory.

31. It is clear that our knowledge of the art of broadcasting, which has been in existence for less than twenty years, is as yet imperfect, and that many problems of its proper use and production are still, therefore, matters of conjecture. Both for this reason and because broadcasting has, by its nature, to provide a continual stream of ever-changing material for a mass of listeners combining every variety of human taste, opinion and prejudice, it is, and perhaps must always remain, a vulnerable target for criticism. The satisfaction of the majority will always involve the dissatisfaction of the minority, and *vice versa.* Like the films, it has to make its appeal to the masses, and not to the selected few ; but unlike them, it has assumed distinct and frequently official functions of information and education, and not of entertainment alone.

32. It has been said by a well-known dramatist that " you cannot mix art and politics " ; yet that is precisely what broadcasting has gradually come to do. King-Emperors and cockney comedians, statesmen and jazz crooners, dons and daubers rub shoulders at the microphone ; at one end of the scale broadcasting wears the top-hat of holy significance, at the other the cap and bells of carnival. It is at one and the same time a civil service and a theatrical company ; and the mixture is new and confusing. Staid professors stand aghast at the antics of comedians ; and comedians " dry up " when professors are about. Even the broadcasting official—unlike the journalist—has as yet coined no name for his profession. Yet " journalist " must once have sounded as strange as " newspaperist " would today : and no doubt the " radio man " who is at once civil servant, administrator, producer and artist, will get his name in time. Meanwhile his listeners repeat unceasingly their already familiar burdens of criticism ; the highbrow, the lowbrow, the classical musician and the light, the scholar and the comedian, the conservative and the communist—each would reserve broadcasting for the expression of his own views and the delectation of his particular tastes. To broadcasting authorities, under this steady and inevitable fire, falls the task of adjusting all the conflicting claims as best they may.

33. Broadcasting is both public and intimate : the voice addresses millions, but speaks only to the unit of two or three : to units, moreover, whose attention must be weaned from other pursuits. The singer on the concert platform, the actor on the stage, the lecturer on the restrum, are assured, at least to some extent, of a quiet and attentive audience : but the broadcast speaker, musician, or programme maker must project his material towards an audience already engaged in reading, writing, talking, eating, dozing, working, dressing, or cooking. If he cannot succeed in gaining attention his programmes must be classed as

failures. Thus, in broadcasting, many accepted standards fail. The ear, divorced from the eye, makes new demands. The infectious enthusiasm of an audience is absent. In the intimacy of the listener's home, the great singer, so popular at music conferences, has not, after all, so good a voice ; the orator, who so easily sways a crowd, becomes a bellowing nuisance ; the academician, who holds so many degrees, is unexpectedly dull and tedious The honours of broadcasting go only to those who can present their material effectively, whether through some happy combination of voice, manner and material, or through a flair for devising programmes in a way which captures the listener's thought. Such people are rare, and their rarity (while it lasts) combined with the immense daily output of broadcasting must inevitably produce an *average* below that of the concert hall, the stage, or the film. A concert of one hour, a film of three, demand months of preparation ; but broadcasting must arrange itself somehow for three hundred and sixty-five days and nights in every year.

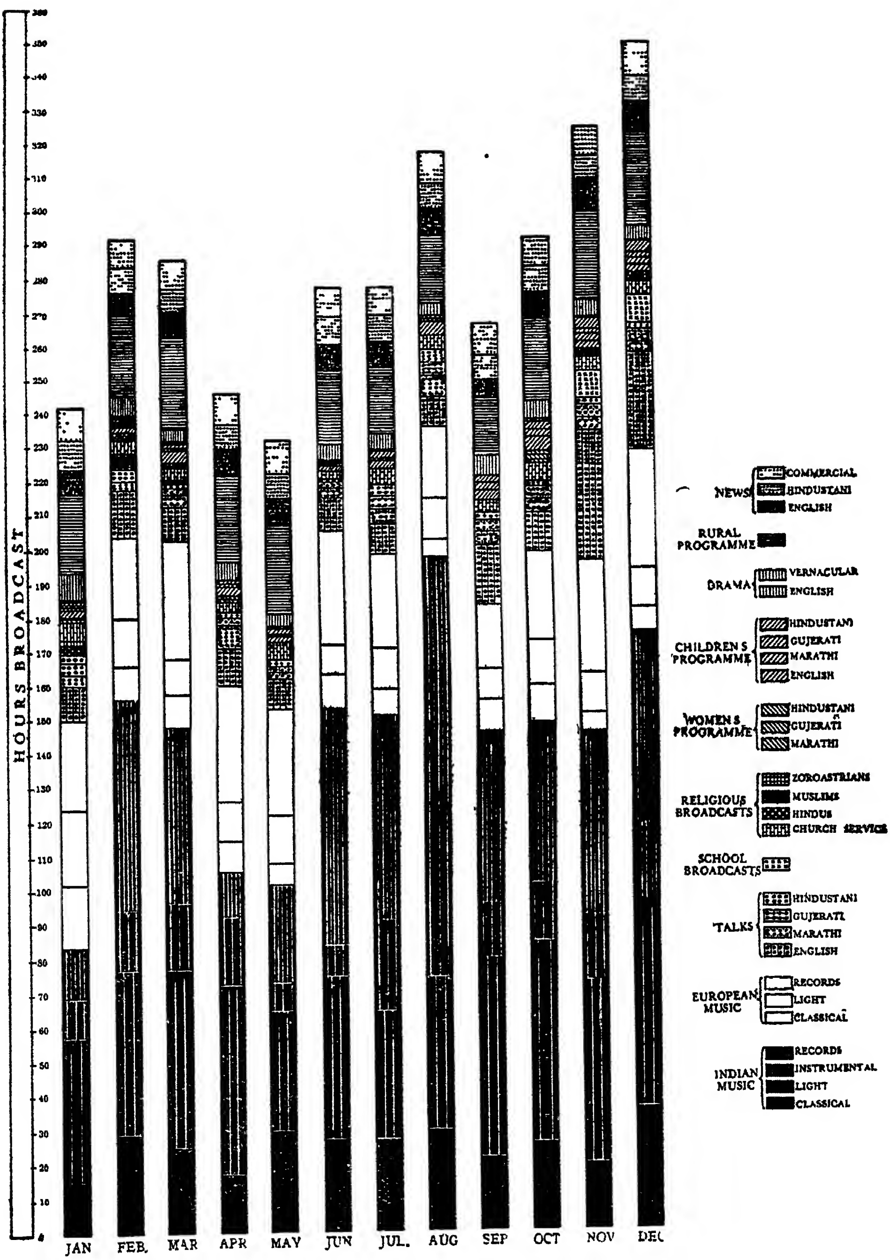
34 The business of broadcasting is to please. Its ultimate aim may be something wider and better than mere pleasing ; but there is no escape from the fact that, first and foremost, it must please. Liseners are not to be bullied or cajoled into listening to something which they dislike. But the mere business of pleasing is an extremely difficult and uncertain process. Human taste is variable and pernickety ; no one opinion is unanimous in matters of taste. Who can foretell the success or failure of a book, a play, a film, a newspaper ? Yet each of these can make its appeal to certain sections of opinion and ignore the rest, whilst broadcasting can afford to ignore no one and must attempt to cater for all. Thus the programme-maker is in a dilemma ; he is both autocrat and slave ; he cannot merely follow his own convictions and opinions, since by doing so he will impose one man's taste and alienate the majority : yet the method and the choice must be ultimately his decision and his responsibility. Nor has he any reliable guide save his own intuition ; letters, normally representing perhaps one in every hundred of his listeners, cannot be reckoned a barometer of opinion as a whole ; advisory committees, however constituted, will disagree on detail as violently as listeners themselves. In the end, only the staff of a broadcasting station can settle the choice, production, arrangement, and timing of programmes, and to that extent they are, and must remain, autocrats ; yet, working as they do under a fire of daily public criticism and under the pressure of providing constant and continuous material, they are also slaves.

35. Such general considerations are clear to anyone who has studied broadcasting : but their re-statement may serve as a useful basis for the proper consideration of programme making. The difficulties of the programme-maker, always great, are perhaps greater in India than in any country of the world. Language, communalism, poverty, the absence of cheap home-made receivers ; the condition of Indian music, the lack of notation and even of generally accepted standards in Indian music ; the prejudice still existing in many quarters against all forms of entertainment, and the almost complete absence of any entertainment tradition ; the comparatively narrow interests of the average, even literate, man ; the state of political unrest—all these and many more, are rocks in the

ALL INDIA RADIO

BOMBAY STATION

MONTHLY ANALYSIS OF PROGRAMMES BROADCAST IN 1938



path of radio development in India The programme-maker is bound down not only by the natural limitations of his medium, but by an inability, in the present state of things, to touch upon any single activity of national life without arousing embittered controversy or rancour.

36. Broadcast programmes in the West fall naturally into four main categories—talks, news, music, and drama. These again may be sub-divided into sixteen categories—light talks of a general nature, talks for schools, and serious talks which may be classed as "adult education"; news bulletins, topical talks, outside broadcasts; light and serious drama, light music, classical music, orchestral music, opera, variety, feature programmes, poetry, and religion In the case of India, we can leave out the "variety" type of music-hall entertainment, so popular in the West, but, owing to the wide gap between rural and urban life, we must substitute another category—village programmes This gives the following classification :—

News	1. News Bulletins.
	2. Topical Talks.
Talks	3. Humour, light, or general talks.
	4. School talks.
	5. Adult Education talks.
Drama	6. Light comedy, melodrama, etc.
	7. Classical, traditional and serious.
	8. Opera
Music	9. Light (vocal)
	10. Classical (vocal).
	11. Orchestral.
Miscellaneous ..	12. Feature programmes.*
	13. Outside Broadcasts.
	14. Poetry.
	15. Religion
	16. Rural Programmes.

Sixteen main categories will thus cover the chief activities of broadcasting, and if these are to be adequately thought out, arranged, rehearsed and presented there must be at least one man (in most broadcasting organizations there are many more) in charge of each, and their salaries

*It may be desirable to attempt a description of "feature programmes" although this is by no means easy. Feature programmes are used a great deal by all broadcasting organizations. It may be said that a feature programme is a method of employing all the available methods and tricks of broadcasting to convey information or entertainment in a palatable form. Feature programmes may range from a description of some process of manufacture interspersed with sound effects, conversations with workers, and so forth to an arrangement of poetry and music compiled so as to present and develop an idea.

must be such as to attract people of the requisite calibre. In India, up to 1935, a Director of Programmes on Rs. 200 per month and two programme assistants on a salary of Rs. 60 per month were considered sufficient for a 20 kilowatt station. The number has gradually risen to 5 programme assistants on Rs. 150 per month, and a Director of Programmes on Rs. 250. India has a long way to go, and much more to pay, before she can expect a fully efficient service. Nevertheless progress, if slow, is constant, as it is hoped to show by the following review of the programme activities of All India Radio under their various heads.

SECTION 2.

Programme Composition.

37. Two statements giving the number of hours devoted to European Music, Indian Music (Instrumental as well as Vocal in both cases), Talks, Drama and Poetry, News and Rural Programmes at the Delhi, Bombay, Calcutta, Madras, Lahore, Lucknow and Peshawar Stations of All India Radio during the periods 1st May 1937—31st March 1938 and 1st April 1938—31st March 1939 are given in Appendix II. The length of programme hours at the respective Stations for these periods is also shown in the form of graphs.

38. It will be observed that the length of transmission for various types of programmes is in the following descending order :—

1937-38.

(*i*) Indian Vocal Music.
(*ii*) European Instrumental Music.
(*iii*) News.
(*iv*) Talks.
(*v*) Rural Programmes.
(*vi*) Indian Instrumental Music.
(*vii*) European Vocal Music.
(*viii*) Radio Drama.

1938-39.

(*i*) Indian Vocal Music.
(*ii*) News.
(*iii*) Rural Programmes.
(*iv*) Indian Instrumental Music.
(*v*) European Instrumental Music.
(*vi*) Talks.
(*vii*) Radio Drama.
(*viii*) European Vocal Music.

SECTION 3.

Music.

39. Music, which must necessarily fill about seven-eighths of any broadcasting programme, is naturally a factor of considerable importance. It may be said that music is, to some extent, " padding ", because it does not instruct or inform, and that it is, therefore, actually of less significance in broadcasting than talks or news. Nevertheless, it is obvious that for a large percentage of listeners, music will be the chief source of entertainment and possibly also the general factor governing popularity or unpopularity.

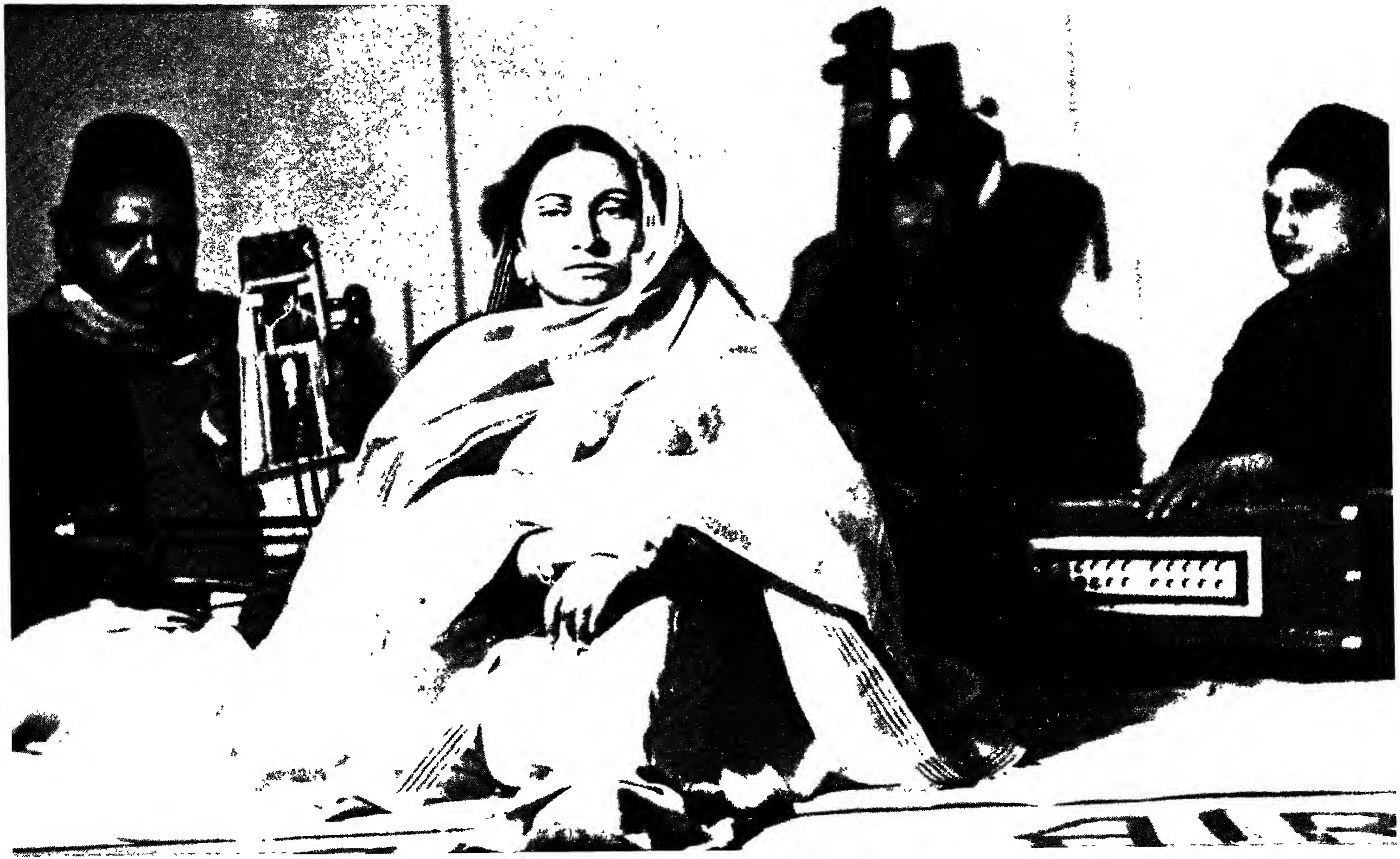
40. In every country there exists a fundamental controversy between light and classical music. In every country also it may be said generally that the majority will prefer light music. Broadcasting in most countries does not base its policy exclusively on pleasing the majority. This is not altogether an altruistic attitude since the enormous output of broadcasting must include as much variety as possible and it is, therefore, to the advantage of broadcasting to widen, if it can, the scope of its listeners' tastes. The slavish acceptance of the limited tastes of the majority would impose on broadcasting programmes a monotony of which listeners would soon weary. Thus we find, in most broadcasting organizations, that classical music gains a place which a majority vote would not actually give it and it is undoubtedly true that the taste for classical music has, in many countries, been considerably strengthened by this policy.

41. In India, however, entirely different values obtain. In the first place, the whole art of music has largely fallen into the hands of prostitutes and mirasis and from this association has sprung a general feeling that there is something inherently immoral about music itself Secondly, owing to the fact that Indian music is built almost entirely on vocal melody and uses only a very limited system of notation, and that rarely, there are few generally accepted standards not only as regards songs and compositions but also as regards voice production and the art of singing generally. Thirdly, the various schools of Indian classical music tend to adopt a rigid and uncompromising attitude both towards any change or progress—in Indian music itself—and towards the violent and increasing impact of western music through the media of gramophone records, films and orchestras. Lastly it may be added—and the point is an extremely important one—that the distinction between so called " classical " and " light " music is to a large extent confused by a consideration of the *words* associated with each type, and thus frequently becomes not a distinction between " classical " and " light " but between " religious " and " erotic ".

42. Under these conditions, the adoption of a standard or even a policy by broadcasting is exceedingly difficult. A part of the Indian public would demand (although this argument is losing ground) that all prostitutes and mirasis should be excluded from the microphone and, in fact, that the employment of singers should be regulated by their morals. An equally important and probably increasing number of listeners would not tolerate amateurs at their present stage of development. The nationalistic outlook on the one hand tends to demand the retention of all things Indian and, therefore, all traditional music and the conventionalised vocal

acrobatics which it sometimes involves, whilst the younger generation, as they come more and more into contact with film and gramophone music, find little pleasure in the traditional singing of the past. To add to the difficulties of the situation, communal bias plays a large part in the likes and dislikes of listeners, and many Indian listeners have actually advocated that a communal percentage should be observed in the choice of artists as it is observed in the choice of recruits to Government service. It need scarcely be added that every Station or Programme Director is accused—and in the absence of definite standards such accusations are difficult to disprove—of employing his relatives or friends exclusively to sing.

43. The appreciation or dislike of classical music, whether based on snobbish, nationalistic, communal or aesthetic grounds, varies a good deal, as might be expected, in different parts of India. To start from the South, there is, strictly speaking, no Carnatic "light" music. It may also be said that Carnatic music, perhaps because it has been comparatively free from outside influence, has preserved a clearer and more definite line of tradition than the music of the North and may perhaps be said to have a purer and more attractive form. Nevertheless, the demand for light film music which is clearly evidenced by the sales of gramophone records of this type in the South is increasing and some modification of the percentage of classical music now given from the Madras Station—about 60 per cent.—will no doubt have to be made. In the Bombay Presidency the questionnaire issued by All India Radio has shown that there is a very considerable diversity of opinion, not only as regards classical and light Indian music, but also as regards Indian and European music In large cities like Bombay and Calcutta there is a fairly strong demand for European music. It is, of course, a matter of conjecture whether, on the one hand, this demand will increase as the knowledge of European music grows or whether the *percentage* of demand for it will decrease as the habit of listening filters down to the less educated sections of the public. It may be mentioned in passing that the experience of All India Radio seems to show that the Indian villager, while preferring his own folk songs to anything else, has no taste for classical Indian music and generally prefers a European military band. The questionnaire issued in Bombay showed a ratio of 100 : 83 : 44 in favour of Indian light music, Indian classical music and European music respectively. In Bengal the impact of Western music is more pronounced than anywhere else in India and the influence of Rabindranath Tagore has further contributed to a relaxation of the traditions of classical music. In Delhi, Lahore and Lucknow tradition remains rigid and is maintained by such institutions as the Marris College of Music at Lucknow. The experience of All India Radio, however, based on the letters received from listeners and on a questionnaire issued from Delhi, seems to show that not more than 30 per cent. of listeners at the outside are interested in classical music in these parts. It is worth remarking, however, that, in spite of its comparative unpopularity in these areas, classical music is strongly supported by influential persons in the Assembly and elsewhere, and the prejudice against light music on account both of its performers and its erotic associations is still strong. At the stations of Northern India, All India Radio has followed as far as possible the opinions expressed by listeners and has given about 35 per cent. of programme time to classical music.


AIR

44. The various trends of Indian music today may perhaps be briefly summarized as follows :—

(a) a rigid interpretation of the rules of classical music by schools which hold that Indian music has reached perfection and that no departure from tradition should be permitted ;

(b) the combination of light and classical Indian music and the encouragement of amateur singers in order that Indian music may, on the one hand, meet the changing tastes of the people without fundamentally altering its character and, on the other, be redeemed from the distaste associated with its present exponents ;

(c) a definite breaking away from present standards combined with the adoption of notation and harmony.

45. In addition to this we may observe a very definite demand for better voice production and a marked appreciation of singers who, though of comparatively little musical ability as measured by Indian classical standards, possess pleasing voices.

46. In sheer quantity alone, the demand made by broadcasting on the available musical talent is unprecedented in India and it is no exaggeration to say that there is hardly a known musician in the country who has not at one time or another been pressed into service by All India Radio. An exhaustive list of the musicians who have hitherto appeared before the microphone would be too long to be included in a report of this nature.

Note on Orchestration and Harmony.

47. A tendency, which is perhaps likely to grow, particularly among the younger generation, towards a breaking away from accepted standards has already resulted in an increased and increasing interest in the possibilities of orchestration and harmony. In this connection All India Radio finds itself in a difficult situation. Both the expressed wishes of listeners and the number of hours to be filled make it almost impossible to do altogether without orchestration and by this very fact All India Radio is compelled to give some sort of lead in a matter in which no accepted standards obtain. It may be argued with very considerable force that orchestration and harmony are both entirely foreign to Indian music and cannot be imposed upon it without destroying its fundamental character and also its particular and enchanting tradition of free improvisation. Against that it may be argued (a) that Indian music today with its tradition of a single melodic line stands in very much the same position as European music 400 years ago, and that harmony is a development which cannot be avoided ; and (b) that the impact of western music through films and gramophones has already induced so much familiarity with orchestration and harmony that the demand for it in Indian music is likely to grow It is quite clear, however, that most, if not all, the Indian orchestras now used in India, whether by the Radio, the Films, the Gramophone Companies, or private persons are very far from satisfactory. Such orchestras are generally conducted on one of two principles. Either all the instruments are played in unison and—unless an enormous time is given to rehearsal—out of time with each other, producing a most discordant effect ; or European tunes with some

sort of notation are ruthlessly (and generally inaccurately) imposed on instruments which are not suited to them. It seems inescapable that if orchestration, as understood in the West, is to be introduced into Indian music the performers must have a thorough knowledge of Western notation and the composers must have a thorough knowledge of harmony. It would seem too that if we are to regard orchestration as inevitable in India the best approach to it would be the establishment of a school in which Indian composers and instrumentalists could learn from a qualified musician the basic principles of harmony which underlie all music, East and West alike. Such composers might then be in a position to develop orchestration without making a sudden and catastrophic change in the valuable instrumental resources of India. Unfortunately All India Radio has never yet possessed sufficient funds to put such a school into operation, but various experiments have been conducted in a small way, notably that of Mr John Foulds at Delhi where a small orchestra was trained in notation and Indian *ragas* have been very carefully harmonised using only the notes within the *raga* itself It may perhaps be stated that All India Radio regards this only as an experiment and not necessarily as a complete basis for future policy. It can, nevertheless, claim that the experiment has been conducted on careful and musicianly lines, and that if this type of orchestration does not succeed it may at least give some lead to Indian composers and help to avoid a sudden and destructive impact of European methods and melodies on any orchestration which may develop in India.

SECTION 4

European programmes.

48. The question of broadcasting European programmes from Indian stations is one which presents considerable difficulties. Talent is restricted and it is not easy to find, except at very high salaries, European musicians sufficiently qualified to select and rehearse artists and to arrange programmes.

49. Apart from this the whole question as to whether European programmes should be radiated at all from Indian stations is one which may arouse considerable feeling. It may very well be argued from the Indian point of view that the funds of All India Radio should be devoted exclusively to Indian programmes and this argument is considerably strengthened by the fact that European programmes—almost inevitably of a higher standard—are more or less easily procurable from European stations. But against this argument may be set, first of all, the fact that a very large percentage of licences in India are held by Europeans who may, therefore, be regarded as entitled to some part of the programmes ; and, secondly, that Indian opinion itself is divided : a very considerable portion of Indian licence-holders enjoy and even prefer European music.

50. Exact statistics of licence-holders are not easy to obtain, since the licensing department of the Posts and Telegraphs has not in the past made a division between Indian and European licence-holders except in the Bengal Circle where out of 15,000 licence-holders, 9,000 are Indian and 6,000 European and in the Lahore Circle where the percentage of European licence-holders is 22. The questionnaire issued in Delhi in 1936

showed that 50 per cent of the licence-holders listened to European programmes. The questionnaire issued in Bombay in 1938 showed that 44 per cent listened to European programmes. On the basis of these figures, it would seem that there is some justification for the continuance of European programmes, at any rate from some stations of the All India Radio network.

51. The principle so far adopted by All India Radio has been to provide some European music at the larger stations, *i.e.*, Bombay, Calcutta, Delhi and Madras but to restrict the programmes to Indian items at other Stations except for occasional visits by well-known European musicians. At the larger stations, the policy has been to give (*a*) one hour of European music at lunch time for which there is a very definite demand ; and (*b*) one hour of European music from 10 to 11 P.M. on one wavelength with an alternative programme of Indian music on the other wavelength. This policy would seem to have proved fairly satisfactory although it can certainly be argued that the proportion of European music is low compared with the number of European licence-holders.

52. The main difficulty, even of this policy, has been to find sufficient talent and provide adequate staff for European programmes at four Stations All India Radio has been fortunate in securing the services of Mr John Foulds* and Mr. Walter Kaufmann, both already well-known in Europe. The work of the latter in carrying through a series of more than 200 Chamber Music Concerts in Bombay has also made him well-known in India.

53. In Delhi, European programmes have suffered, with some notable exceptions, from a dearth of talent and also from the fact that very few Europeans are available in the plains for more than six months of the year. If the present system of relaying proves successful under all atmospheric conditions it may be possible in the future to concentrate European programmes at Calcutta and Bombay where more talent is available and to relay them to other stations as circumstances seem to require.

SECTION 5.

Talks.

54. As has been stated earlier, the Indian Broadcasting Company started in 1927 with only two mediumwave stations, namely, at Calcutta and Bombay. During that year Calcutta broadcast only 25 talks out of which 24 were in English and one in an Indian language, and Bombay 78, out of which only 7 were in Indian languages and the rest in English. These were of a general kind, and there was no attempt at any policy or objective through talks. Eight years later, in the calendar year 1935, that is to say just before the establishment of the Delhi station and the beginning of the new development scheme the number had risen to 392 talks from Calcutta and 181 from Bombay.

*Mr. Foulds died suddenly on April 25, 1939.

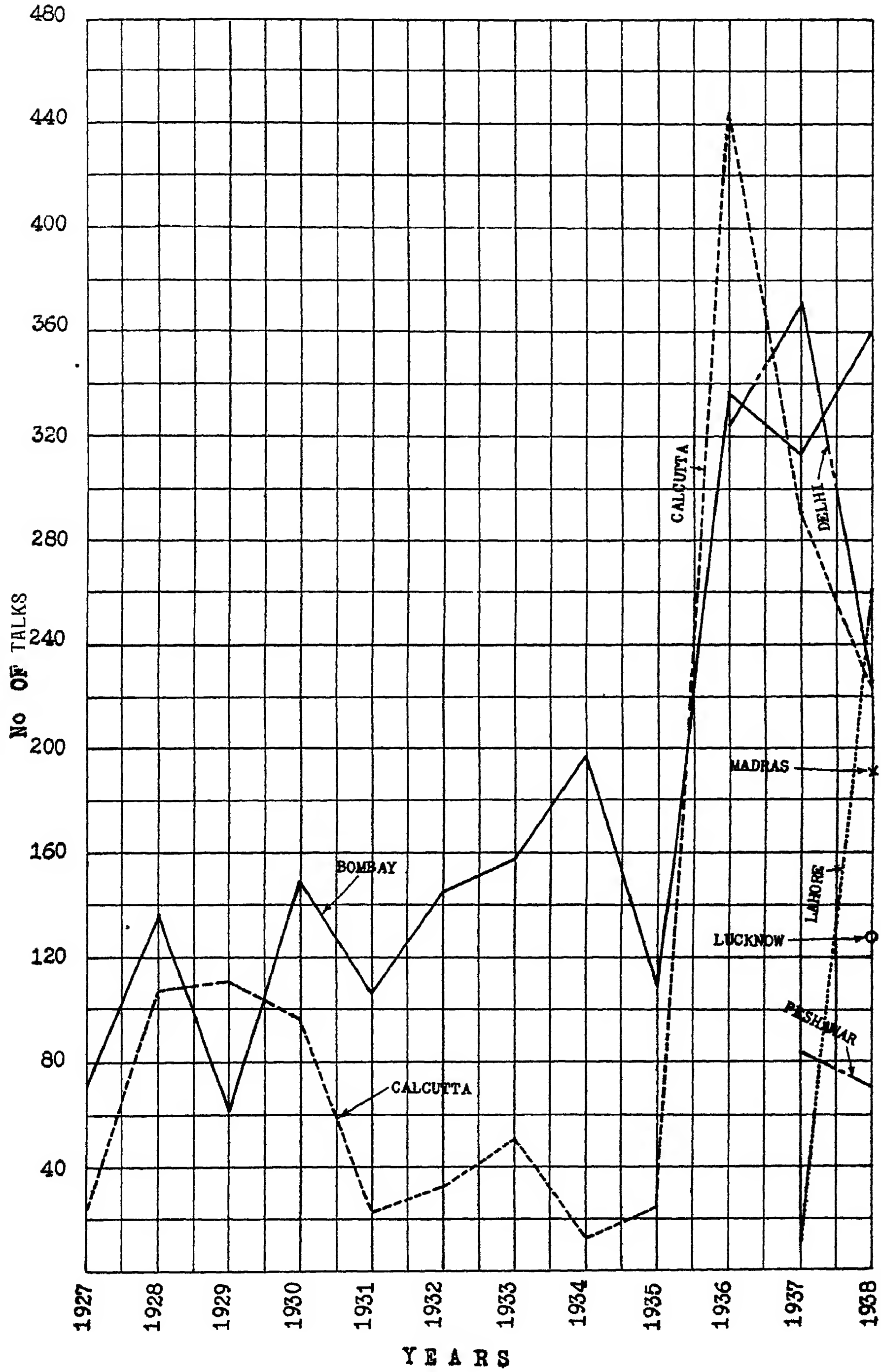
55. The following table gives the number of talks broadcast from the Stations of All India Radio from 1927—1938 :—

Number of Talks (January—December).

Year.	Delhi.		Bombay.		Calcutta.		Madras.		Lahore.		Peshawar.		Lucknow.		Total.	
	Eng.	Indian	Eng.	Indian.	Eng.	Indian.	Eng.	Indian	Eng.	Indian	Eng	Indian.	Eng.	Indian	Eng	Indian
1927	..	..	71	7	24	1	..	..	..	..	..	..		.	95	8
1928	..	..	136	22	106	74	..	..	.	..	..	.	..		242	96
1929	..	..	62	..	111	55	..		..	..	..	..	..		173	55
1930	..	..	146	2	97	153	..		..	..	..	..	..	..	243	155
1931	..	..	107	66	23	213	.	.	..	..	..		..	.	130	279
1932	..	..	144	87	32	372	..	..	..	..	..	..	..	.	176	459
1933	..	..	157	105	51	247	.		..	..	..	..	.		208	352
1934	.	..	197	73	12	339	..			.		.	.		209	412
1935	..	..	108	73	24	368	.	.	..	..	..	.		..	132	441
1936	324	499	336	143	444	174	.	..	.		.		..		1,104	816
1937 .. .	371	460	313	325	290	455			9	9	83	265			1,066	1,514
1938 ..	225	309	360	333	223	651	189	154	261	282	71	167	127	231	1,456	2,127

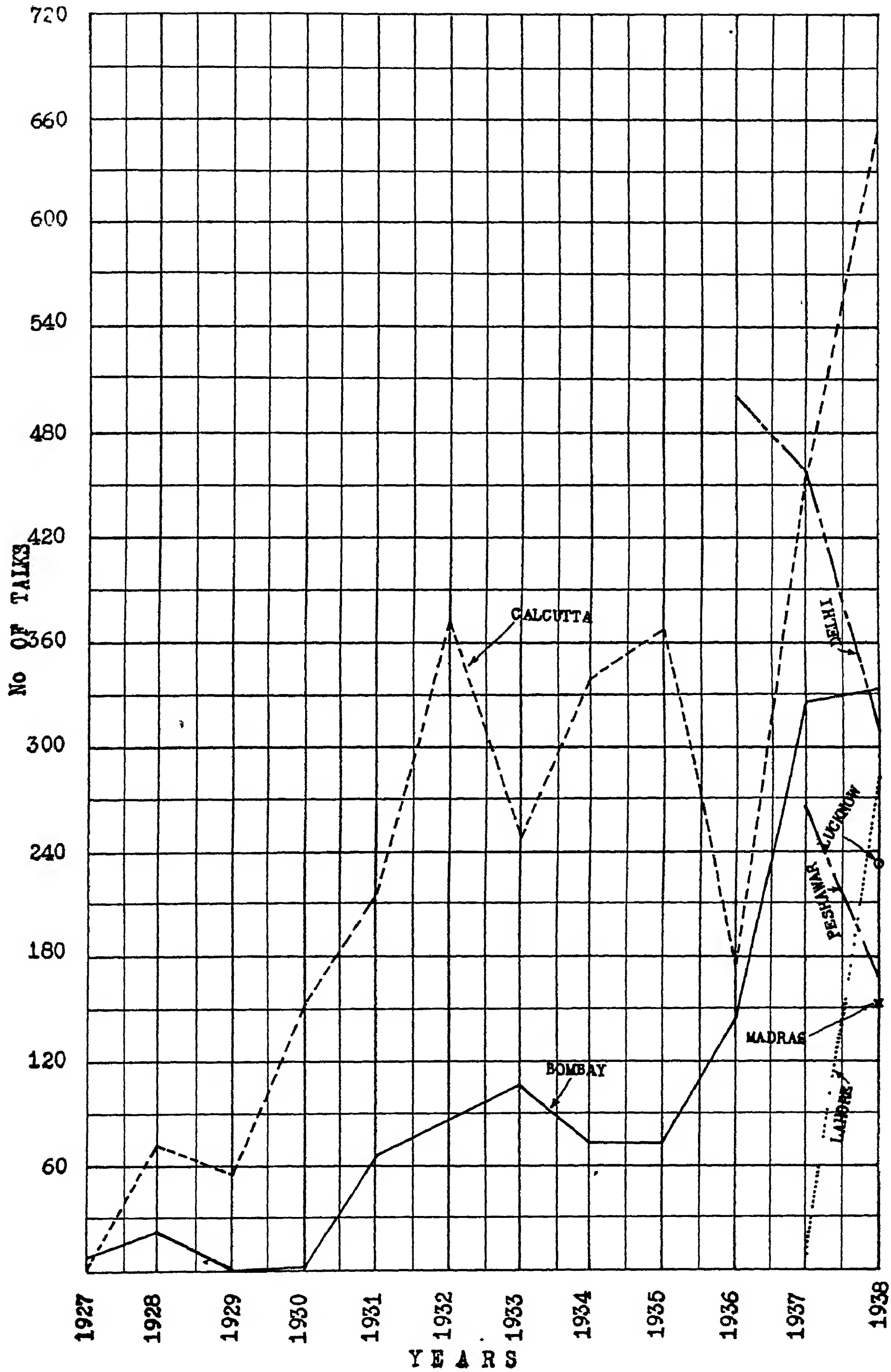
Space does not permit any detailed description of the ground covered.

NUMBER OF TALKS
(ENGLISH)



NUMBER OF TALKS

(INDIAN LANGUAGES)



Note on Topical Talks

56 Topical talks, of which great use is made by most broadcasting organizations, have, owing to various factors, proved a great difficulty in India. The topical talk may be described as a comment by an expert on something which has happened on that very day Should there, for instance, occur a shipwreck or an earthquake or a political crisis, or the death of some prominent person, most broadcasting organizations would endeavour to include in their news, or immediately after it, a talk by some authority on the subject. This means, of course, that such a talk has to be written at great speed and also that suitable speakers have to be available. This is seldom the case in India and since broadcasting in India does not yet command the respect which it does in Western countries, few Indian authorities can be prevailed upon, even if available, to take the necessary trouble at short notice. Topical talks, have, therefore, with rare exceptions been a notable omission from broadcasting in India.

57 On the other hand, certain talks which are not quite of such an immediate nature may also be regarded as topical. Notable among these are talks on current affairs and periodic commentaries on sporting events. Talks on Current Affairs were introduced at Delhi in English on the 1st February 1936 and in Hindustani on the 14th September 1936. Since that time they have been a regular feature of all stations and topics of interest are thus dealt with, if not immediately, at least within the week. Sports commentaries, book reviews and film reviews have also been added.

SECTION 6.

News Bulletins.

58. Up to 1935 the editing of news bulletins, as carried out by other broadcasting organizations, had not been attempted in India. A news summary had, from 1930 onwards, been given by Reuters to the Stations at Bombay and Calcutta at a reduced rate of payment which had been accepted by Reuters on the ground that the funds at the disposal of the Indian State Broadcasting Service were extremely limited. In these circumstances it was perhaps natural that the summaries given should have been brief and disconnected and frequently out of date. The Controller, on his arrival at Delhi, found that no arrangement had been made for the editing of any news bulletins there or elsewhere and immediately asked for the appointment of an editorial staff. The Government of India after some correspondence with the India Office. agreed to the appointment of one Editor on a salary of Rs. 700.

59. The Delhi Station was then within a few days of opening and it was extremely difficult to secure an experienced journalist at such short notice. After enquiries had been made, the services of Mr. H. G. Franks were obtained on a temporary footing. Government, however, decided to dispense with Mr. Franks' services as News Editor in May 1936 and Mr. G Noronha was appointed, again in a temporary capacity.

60 Meanwhile negotiations were proceeding for the advertisement of the post on a salary of Rs. 1,000 and for simultaneous Selection Boards in India and in England. In May 1937 the Federal Public Service Commission considered the candidates from India and decided that none of them

was suitable for the post. The Selection Board held in England recommended Mr. Charles Barns who was appointed to the post in July 1937.

61. In the meantime the whole future of the News Service had been under consideration from December 1935 onwards. The Controller of Broadcasting had put forward two separate schemes : (*i*) a de-centralized scheme by which an Editor on a comparatively low rate of pay and a small staff would be sanctioned for each Station and each Station would work independently and (*ii*) a centralized scheme with a highly paid Editor from which news would be relayed to all stations. The cost of a decentralized scheme was estimated at Rs. 1,200 per month per station excluding the fees paid to News Agencies, (the amount of which per station would depend on the number of stations), whilst the cost of a centralized scheme was estimated at Rs. 7,000 per month including the cost of the fees paid to News Agencies It was clear that the choice between the two schemes depended to some extent upon the probable development of stations since the adoption of the local scheme would be cheaper only so long as there were not more than four stations and thereafter would increase by Rs. 1,200 a month for every new station.

62. There were also obvious advantages in centralizing the news and employing a more highly paid staff and it was decided in May 1936 to adopt a central scheme. It was at first proposed that dissemination should be through the ordinary telegraph system but this, for various reasons, did not prove feasible. Later, when the Lahore station was established, the news was relayed from Delhi to Lahore and Peshawar and later to Lucknow by telephone lines but this method proved both expensive and unreliable and it was clear that the ordinary telephone lines would not be suitable for the transmission of news to places as distant as Bombay, Calcutta and Madras. Tentative negotiations were opened with the Posts and Telegraphs Department for the supply of special lines such as those used by the B.B.C. in England, but the cost of establishing and maintaining such lines was found to be prohibitive. It was, therefore, decided in 1937 that receiving centres should be established at all stations and the news transmitted by one of the two Delhi shortwave transmitters so that a sufficient number of wavelengths would be available to meet conditions at different times of the day and at different seasons.

63. Up to 1935 only two bulletins a day, one in English and one in an Indian language had been radiated by the stations at Calcutta and Bombay. These as a rule were given in the evening between 8-30 and 9-30 P.M. This practice was at first followed by Delhi but towards the end of 1936*, an experiment was made by the introduction of an additional news bulletin (and its translation in Hindustani) earlier in the evening (5 and 5-10 P.M.). Curiously enough this step was little appreciated and was even criticised and letters were received from a very considerable number of listeners protesting that they did not want news more than once a day. The experiment was, therefore, dropped on the 1st March 1937. A bulletin at lunch time (1-55 P.M. English and 2-00 P.M. Hindustani) was introduced from the same date, but this too was discontinued from 16th April 1937. On the 16th April 1937 a morning bulletin at 8-40 in Hindustani and 8-50 in English was introduced Mr. Barns, however, on his arrival in September 1937, and after the appointment of a Sub-Editor in December 1937, decided that there could be no real grounds for supposing that India differed so violently from other

*1st November 1936.

countries, that news bulletins at various times of the day would not be appreciated. On the 1st October 1938 an evening bulletin at 6 P.M. in English and 6-5 P.M. in Hindustani was therefore added.

64. At the end of March 1939, the position with regard to the news bulletins broadcast from various stations of All India Radio was as follows :—

(i) General News.

Stations.	News in English.	News in Indian Languages.
Delhi .	8-50— 9-00 A.M. † .. .. †	9-00—9-10 A.M.
	6-00— 6-05 P.M. † .. .. †	6-05—6-10 P.M.
	9-30— 9-50 P.M.	9-15—9-30 P.M.
	11-00—11-05 P.M.	....
Bombay ..	8-50—9-00 A.M. †	....
	6-00—6-05 P.M. †	....
	9-30—9-50 P.M.	9-00—9-15 P.M.
	†Except on Sundays.	
Calcutta ..	8-45— 9-5 P.M.‡	8-25—8-45 P.M.‡
	11-00—11-5 A.M. (on Sundays only)	....
	‡7-00—7-15 on Fridays ..	‡7-15—7-30 on Fridays.
Madras ..	9-00—9-20 P.M.	....
Lahore (Relayed from the Central News Organization at Delhi.)	9-30—9-50 P.M.	9-15—9-30 P.M.
Lucknow (Relayed from the Central News Organization at Delhi.)	9-30—9-50 P.M.	9-15—9-30 P.M.
Peshawar (Relayed from the Central News Organization at Delhi.)	9-30—9-50 P.M.	9-15—9-30 P.M.

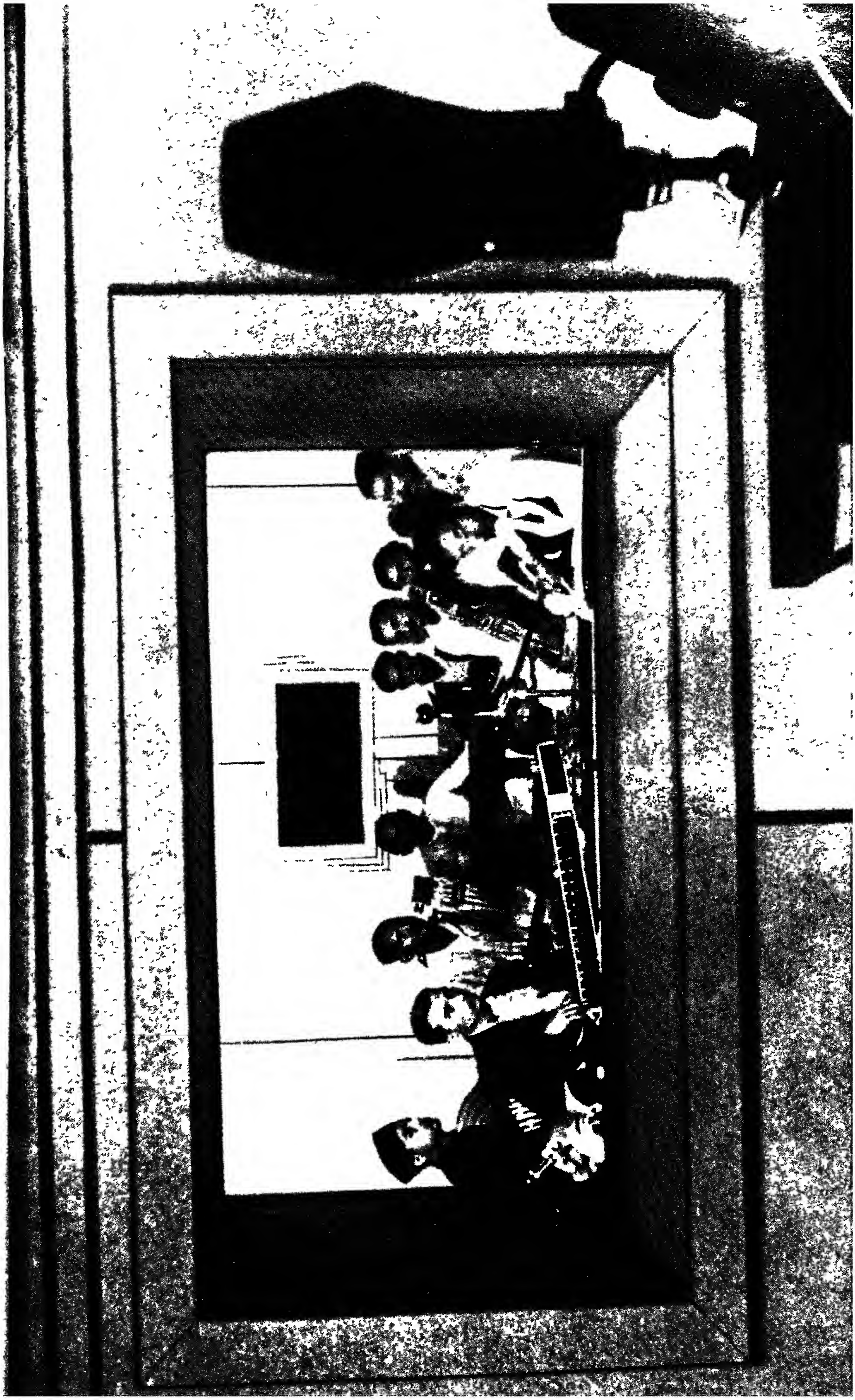
(ii) Commercial News.

Stations.	Commercial News in English.	Commercial News in Indian Languages.
Delhi ..	..	Markets rates during the Rural Hour—(7-15—8-00 P.M). (Hindustani).
Bombay ..	1-05—1-10 P.M. .. 7-30—7-45 P.M.	1-00—1-05 P.M. (Hindustani).
Calcutta .	1-15—1-17 P M. .. .. 9-05—9-10 P.M.	2-00—2-05 P.M. (Bengali) 8-20—8-25 P.M. (Bengali).
Madras ..	...	During Rural Hour at 6-00—6-30 P.M. (Tamil and Telugu alternate days).
Lahore ..	....	During Rural Hour 6-30—7-15 P.M
Lucknow ..	....	....
Peshawar ..	....	In Pushto during Rural Hour 7—8 P M. (about once a week).

SECTION 7.

Drama.

65. Radio drama has, in all countries, proved one of the most difficult items of broadcast programmes. There are three obvious reasons for this. In the first place a play, and particularly a play that is not seen, demands fairly concentrated attention on the part of its listeners ; it may even demand, if it is to be fully effective, that the lights in the listener's room should be extinguished. Few listeners wish to give such attention to their



radio sets A radio play may be switched on half way through and is likely to be interrupted by conversation or visits or household duties. Under such circumstances, even a first rate play on the stage would have little chance of success. Secondly, broadcasting can never compete with the stage as an attraction to playwrights Even the richest broadcasting organization will hardly pay a playwright more than Rs. 1,000 for an hour's play whereas a fortune may await him as the result of a successful theatrical production Thirdly, the broadcast play demands a special technique, excluding all visual media and placing the emphasis exclusively on words and sounds Owing to the comparative lack of reward, few first class playwrights will take the trouble to learn such technique As a result, the broadcast play in the West has continued to be for the most part either a "slick" contraption by an unknown playwright or an adaptation by the broadcasting staff of a novel or story using "scenes" patched together by a narrator. It is possible that the development of the latter process might lead to interesting results but it is also held by many that the broadcast play is only at best a passing phase since the advent of television will quickly put an end to it and it is, therefore, not worth developing.

66. In India the broadcast play, because it is at the same time the most popular and the most difficult item to obtain, has been, up to the present, a constant source of trouble to the programme maker and producer.

67. In Bengal, where theatrical tradition is perhaps stronger than in any other part of India, a regular weekly theatrical night for Indian drama was adopted as early as the 10th January 1928. This tradition has been continued and is undoubtedly popular with some sections of listeners though it is a moot point whether its popularity will survive much longer. The plays given have been usually of about three hours' duration and are adapted almost exclusively from stage plays thus carrying a great deal of cumbrous stage technique into the studio. There can be no doubt whatever that the length and technique of stage plays are fundamentally unsuited to broadcasting though they have a certain popularity value as a kind of substitute for the theatre itself.

68. In Bombay, partly owing to the language difficulty, little attention was paid to drama before the 20th July 1930. Since then, however, the number of plays broadcast has gradually risen although, owing to the diversity of languages, it is difficult, if not impossible, to broadcast a sufficient number of plays to satisfy every class of listener. In 1934, 7 Gujerati, 1 Marathi and 7 Hindustani plays were given from this station. In 1938 the number rose to 24 Gujerati, 28 Marathi and 73 Hindustani plays.

69. In Delhi an attempt was made from the beginning to satisfy Indian listeners in this respect and 65 Hindustani plays were given in 1936, 102 in 1937 and 101 in 1938.

70. The experience of All India Radio shows that successful radio plays and even successful dialogues attract more appreciation from listeners than any other item. Even in the villages this holds true. The main difficulty in India, however, is to obtain a sufficient number of good plays. Owing to the dearth of plays, the Delhi Station at the instance of its Advisory Council, offered in July 1937 a prize of Rs. 250 for the most successful radio play. The entries were judged by the Drama Sub-

Committee of the Advisory Council and it was decided by them to award no prize since they considered no play good enough. It is clear that in India, possibly because the tradition of the theatre is notably lacking, budding playwrights have not as yet turned their attention seriously to radio drama. There are signs, however, that they will do so in the not too distant future.

71 In 1938 the following number of plays were broadcast by the Stations of All India Radio :

No. of plays broadcast during 1938 (January—December) from the Stations of A. I. R.

Stations.	English.	Bengali.	Hindustani	Tamil	Telugu	Canarese	Gujerati	Marathi.	Pushto	Punjabi.	Total.
Delhi	.		101	..	..	..	.	.		..	101
Bombay	8	.	73	.		.	24	28	.	..	133
Calcutta	34	65	4				.	..			103
Madras	.	.		34	25	2					61
Peshawar	..		52						33		85
Lahore	6	.	41		.		.	.	..	2	49
Lucknow	1	..	44		..	..	..	.	.	..	45
Total	49	65	315	34	25	2	24	28	33	2	577

72. The most successful productions included :—

English.

1. The Ghost Train .. .. .. Calcutta
2. The Broken Branch .. .. .. Madras.*
3. Twelfth Night .. .. .. Madras.*
4. The Monkey's Paw .. .. .. Lahore.
5. The Rocking Horse Winner .. .. Lahore.
6. Journeys End .. .. .. Calcutta.
7. Anasuya .. . . Bombay.

Hindustani.

1. Sita Tyag .. ..
2. Bhishma, Pratigya .. .. .. Bombay.
3. Aphimi ne Radio Suna .. ..
4. Salma .. ..

*Broadcast in 1939.

Hindustani—contd.

5.	She Speaks	Calcutta.
6	Inkar-aur-Eqrar	
7	Mar-i-Asteen	
8.	Qartaba ka Qazi	
9	Kasid-i-Awwal	
10	Tabib ..	
11	Lakshmi ka Swagat	
12	Ban Devi ..	Lahore.
13.	Drama ke Lawazim	
14	Famine	
15	Us ka Ramu	
16.	Siraf kanon ke he	
17.	Sannata ..	
18.	Suhag ka Dan	Peshawar.
19	Badr-e-Munir	
20.	Hamsai ki Billi	
21	Jhoota Khawab	
22	Mir Sahib ki Id	
23.	Moon Shine Theatrical Co. ; (A series of four satires on Indian Stage).	
24.	Papi Nainan	Lucknow
25.	Qartaba ka Qazi	
26.	Rehearsal ..	
27.	Ao Kahani Likhen	
28.	Inder Sabha	
29.	Samjhauta	
30.	Ek Tha Raja	
31.	Dekha Jaega	
32.	Zamin Gol Hai	
33.	Akhiri Patti	
34.	Jawab ..	
35.	Mem se Shadi	Delhi.
36.	Khushi ..	
37.	Man ke ek Vakil	
38.	Burha Falsafi	
39.	Wah ri Qismat	
40.	Tammat Bishshar	
41.	Tajvizen ..	

Marathi.

1.	Shabda Swapna	
2.	Bandwali-chya Mastarani	
3.	Khuni Kon	Bombay.
4.	Punar Milan	

Gujerati

1. Akbarshah	..	Bombay
2. Laganma Vaghan	..	
3. Prem Nu Moti	..	

Bengali.

1. Profulla	..	Calcutta
2. Garilar Thaba	..	
3. Grihaprabesh	..	
4. Maitrayee	..	
5. Raktakamal	..	
6. Swami-Stree	..	
7. Alik Babu	..	
8. Subhajatra	..	
9. Sesh-Parani	..	

Tamil.

1. Nandanar	..	Madras
2. The Bhagwat Gita	..	
3. Vipranarayana	..	
4. The First Poem	..	

Telugu

1. Kacha Devyani	..	Madras
2. Devil's Island	..	
3. Parityagam	..	
4. Dongatakam	..	

Canarese.

1. Mandodari	..	Madras

Punjabi.

1. Ankhen	..	Lahore.

A Note on Opera.

73. The above list contains a number of "straight" plays as well as musical plays In the domain of drama, India is still under the influence of its lingering theatrical tradition which looks upon music as an important, if not almost an essential, part of dramatic productions. The repertoire inherited from the stage contains hardly any play in which about a third to half the time is not taken up by musical items. Nor can an Indian cinema producer today venture to place on the market, without grave misgivings, a film which relies solely on the spoken word. All India Radio found no difficulty in falling in with this tradition which gave it easy access to ready-made material and ample scope for exploiting the possibilities of its medium With their orchestras, their bands of musicians, and their libraries of gramophone records, the various stations of All India Radio were in a position to give to the musical type of drama a fresh lease of life With the facility with which broadcasting could switch on from spoken word to music and from music to spoken word, could superimpose

one on the other, could dissolve music into words or words into music, the production units at the various stations were tempted to adapt and experiment with the strictly stage version of such plays. At Calcutta the three-hour play, too reminiscent of the stage, continued for a long time, as the listeners long habituated to theatrical performances of great prolixity were content to be provided with a slavishly imitative substitute. Even at this station, however, there are signs that a more subtle use of music in plays, than mere alternation of it with the spoken word in self-contained chunks, is beginning to be more widely appreciated. Experiments at other stations have concentrated (1) on the curtailing of such productions to reasonable limits, (2) the elimination of songs which lack intrinsic merit but which were included in the stage version merely in observance of certain conventions, (3) the achievement of fluidity in the double use of music and spoken word, and (4) a more subtle use of instrumental music. All India Radio has thus helped in the preservation and renovation of what may be called the operatic form of Indian drama and it is to be hoped that this form will stimulate Indian composers and playwrights alike. Nor is the field restricted to Indian composers only. The production at Bombay of the opera entitled "Anasuya" by Walter Kaufmann clearly indicates the possibility of Indian themes being used for English operas by Western composers.

SECTION 8

School Broadcasting.

74. Educational broadcasts of an occasional and informal character have been in existence at Bombay since January 1929 and at Calcutta since November 1932. But with the creation of a separate department of broadcasting on the 1st March 1935 and the installation of a powerful radio station at Delhi, it was considered advisable to concentrate at first on the more immediately remunerative and popular types of broadcast programmes and in view of the limited funds available for programmes, it was not found possible to undertake the organization of any specialised broadcasts.

75. It was however soon felt that the demand for educational broadcasting was growing and when in 1937 the University of Calcutta and the Education Department of Bengal showed an interest in the matter, the Station Director, Calcutta, was authorised to accede to their desire for the provision of regular school broadcasts as far as funds permitted. In November 1937, Calcutta began to broadcast half-hour programmes for schools on two days in the week and continued to do so till September 1938. In the meantime, a circular letter laying down the tentative policy of educational broadcasting was addressed to a number of educationists in India and their views and suggestions were invited. The response was encouraging in that it showed that there was every reason to expect that educational authorities would welcome the introduction of broadcasting in schools and would co-operate in shaping and participating in the programmes, and where possible allot funds for the provision of radio sets.

76 It was, therefore, decided to embark upon school broadcasting forthwith instead of insisting on an extensive installation of receiving sets as a condition prior to such broadcasts, since it was felt that the radiation of school programmes would in itself be the best means of

stimulating interest and persuading educational institutions to equip themselves with the means of benefitting from them. All stations were, therefore, instructed to draw up school programmes for October 1938–March 1939 in consultation with the educational authorities in the provinces. Programmes for Peshawar, Lahore, Delhi, Lucknow, Calcutta, Madras and Bombay were, therefore, arranged, but, owing to unexpected financial limitations, it was decided to postpone the Peshawar, Lahore and Lucknow programmes till the financial outlook was brighter. In addition to the ordinary school broadcasts under this scheme, the Madras station of All India Radio gives extra Tamil programmes for primary schools for half an hour on five days in the week. Previous to the opening of this station in June 1938, the Radio Station owned by the Madras Corporation used to broadcast Tamil programmes to primary schools and, in deference to the wishes of the Corporation, All India Radio undertook to continue them as before. The present position is as follows :—

Station.	Date of commencement of regular educational broadcasts.	Number of days in the week.	Time.
			P.M. P.M.
Calcutta . ..	3rd October	2	2-00 to 2-45
Madras . ..	(a) 1st September	5	4-00 to 4-30
	(b) 3rd October	3	2-00 to 2-30
Delhi	3rd October	6	2-00 to 2-30 (Approx.)
Bombay	11th November	3	3-30 to 4-30

77. Pamphlets giving the detailed syllabus of the school broadcasts from these stations are distributed to the listening schools, free of charge, to enable them to make reception arrangements in advance.

78. Amongst the subjects covered are—

Literature—
- English.
- Hindustani.
- Marathi.
- Gujerati.
- Bengali.
- Tamil.
- Telugu.

Indian History.
World History.
Science.
Biology.
Nature Study.
Horticulture.
Physiology.
Health and Hygiene.
Geography.
Biography.
Astronomy.
Sociology.
Economics.
Civics.
Sports.
Current Topics.

79. The educational policy of All India Radio may be indicated here in outline. It may be taken for granted that educational broadcasting, whatever the topics with which it is likely to deal, will have to be done on various levels to suit the various educational levels obtainable among its listeners. Generally speaking, it may be assumed that there will be some talks exclusively intended for the primary stage, others exclusively intended for the middle stage and yet others exclusively intended for the high stage but that, in between, there will be quite a number of topics and talks suitable for two contiguous stages at the same time. It may again be recognised, perhaps as a principle, that educational broadcasting should not attempt to replace the teacher or the professor but to supplement his work. What the radio endeavours to concentrate on are : (*a*) topics which will be found useful in widening the mental horizon of students but which do not naturally fall within the four corners of the school or university syllabus, and (*b*) such aspects of school subjects as cannot be adequately dealt with in an average institution owing to difficulties of the school system, such as lack of time or the intellectual limitations of an average teacher. It is not to be denied that a school curriculum is generally interpreted by teachers too rigidly and attempts to give it a rather wide interpretation have not been successful in the past. Furthermore the number of enlightened teachers who are capable of taking a wide interest themselves is not very large in any province. If a talk given by one capable person could be made available to a large number of schools, a facility which only the radio can provide, India would have taken a very great practical step towards improving her educational system

80. It is yet too early to say how far the present educational policy of All India Radio meets with the requirements of the schools concerned. Some of the difficulties, however, of arranging such programmes may be briefly touched upon. The first of these is the dearth of qualified speakers. Not all good class room teachers are also equally good broadcasters and it will be some time before All India Radio can discover and have at its disposal a sufficiently large number of speakers who can appeal to invisible audiences of the school-going age without any aid except that of the spoken word, and who have a sufficiently wide outlook and attractive manner of presentation to make up for the limitations of this new medium. Secondly, language problems loom as large here as in other forms of education and lead to a considerable amount of wasteful, though at present inevitable, fragmentation and duplication. Thirdly, there is at present a considerable difference of opinion with regard to the suitable times for such broadcasts. Fourthly, it is felt that the less progressive type of teacher not unnaturally looks upon educational broadcasting as an uncomplimentary intrusion and is not yet willing to co-operate in creating favourable listening conditions in the classroom. It is therefore necessary that the more enlightened educationists should help the institutions under their charge to realise that broadcast programmes cannot achieve their aim unless the teachers, even more than the pupils, make up their mind to put them to the best possible use. Lastly, the funds allotted to educational broadcasting would not yield the fullest return unless a much larger number of schools than at present is equipped with receiving sets suitably sited and properly maintained. Although educational authorities are on the whole sympathetic and helpful, sufficient provision at present does not exist for the installation of receiving sets in schools on

any extensive scale. According to the latest figures collected through the courtesy of the Directors of Public Instruction in the various provinces, the number of educational institutions equipped with radio sets is as shown in the table below :—

Number of sets in use in Schools and Colleges.

Province.	Number of Institutions possessing sets.		
	Colleges.	Schools.	Total.
1. Madras	18	27	45
2. Bombay	(Not available separately.)		81
3. Bengal	14	37	51
4. United Provinces..	6	11	17
5 Punjab (Government Colleges and all Schools)	14	186	200
5a. Punjab (Private Colleges only) .. .	19	..	19
6. Central Provinces and Berar	3	20	23
7. Assam	*Nil*	*Nil*	*Nil*
8. Bihar	4	2	6
9. North-West Frontier Province	1	12	13
10. Sind	*Nil*	6	6
11. Orissa	2	2	4
12. Delhi	2	7	9
13. Ajmer-Merwara	*Nil*	4	4
Total ..	83	314	478

SECTION 9.

Rural Broadcasting.

INTRODUCTORY.

81. The first definite attempt to introduce village broadcasting into India was made by the North-West Frontier Province Government early in 1935. The scheme originated chiefly from the activities of the Marconi Company. That Company was anxious to get broadcasting started in India and offered to the Government of the North-West Frontier Province the free loan of a transmitter and some village sets, on the understanding that the whole equipment would be purchased after a year's trial if found satisfactory. The receiving sets used were specially made not only to resist heat, dust and insects but also to give a volume of sound which could be heard at about one hundred yards distance. The aim of this was to enable the villagers to listen in their houses or, to put it in another way, to force broadcasting upon the villager. These sets were priced at Rs. 400 and with the cost of installation and batteries cost altogether about Rs. 800. The Peshawar scheme was of course experimental and suffered from the outset from a paucity of funds and staff and also from the difficulty of transporting the batteries and recharging them. The programmes given were, in most cases, digests of agricultural pamphlets, etc., and owing to a lack of skilled editing tended to be above the heads of the villagers. Nevertheless, some useful experience of rural broadcasting was gained and the experiment was by no means valueless. Some dramas were broadcast, and these proved not only popular but also extremely effective in the lessons which they drove home.

82. In 1935 the Punjab Government decided to grant a sum of Rs. 48,040 towards a scheme of village broadcasting to be radiated by the Delhi Station (which was established in January 1936). The funds were to be spread over a period of two years. This experiment was placed in the hands of Mr. F. L. Brayne, Rural Reconstruction Commissioner, Punjab, and owing to the difficulty of obtaining sets it did not start until June 1936. Sets similar to those in operation in Peshawar were used since there was no other suitable set on the market and sufficient data were not available in regard to possible modifications. After touring the villages and observing the reactions of villagers, the Controller of Broadcasting came to the conclusion that there were the same difficulties in the Punjab as in the Peshawar experiment, namely that the talks given were too long and too difficult for the villager and the entertainment part of the programme was not sufficiently attractive or well designed to gain his full attention. It became clear, however, that the villager tended to regard the radio with suspicion, as a possible means of taxation or instrument of propaganda, and that apart from this the limited range of his interests made him an excessively difficult listener to please. A considerable amount of experiment in this specialised type of programme work was clearly essential before the villagers' interest could be really aroused, and unless this were done rural broadcasting was obviously useless.

83. After some discussion on these points it was agreed that the Punjab funds should be handed over to the control of All India Radio with certain reservations as to the heads under which they should be spent ; the staff were chosen (with a special stress on their abilities of presenta-

tion and production) by All India Radio from applicants sent by the Commissioner for Rural Reconstruction. A new arrangement of programmes was then introduced, which was intended, for the time being at least, to place emphasis on entertainment rather than instruction so that the villager might become accustomed to the radio and regard it with pleasure rather than with suspicion. An hour's programme was given daily half an hour after sunset, since this appeared to be the time when villagers, having come in from their fields, washed and eaten, were most likely to be free. In this hour's programme no item was permitted to last more than five minutes, since it had been noted that the villager's attention was apt to wander very quickly from any one subject ; and music was alternated with talks or dialogues in five minute stretches. The dialogue method proved by far the most successful means of engaging the villager's attention and this was later amplified by introducing short dramas, which became the most popular item of all.

84. Nevertheless, owing to difficulties of distance and transport, and the conservative attitude of most villagers towards any novelty, it was not (and is not yet) easy to lay down any clear cut policy. The Government of India had originally laid down in 1935 that the Centre should be responsible for entertainment broadcasting while the Provinces should be responsible for educational broadcasting. Education and entertainment cannot, however, be arbitrarily separated in Broadcasting. In the case of the villager, particularly, it is essential that they should be skilfully mixed. In 1936 the previous policy was therefore modified and it was decided that All India Radio should take the responsibility for all programmes but that the provinces should be responsible for the provision of village receivers ; the responsibility of each, however, was not clearly laid down with regard to the supervision and placing of sets and their maintenance, and the exact measure to which Provincial Governments could advise on or interfere with programmes.

85. Difficulties of interpretation naturally arose. In 1936 the Government of Bengal decided to provide 15 sets and the Government of Bombay a similar number. In the first case the local Government placed the administration of funds directly in the hands of the Station Director but stipulated that the sets should be placed in Midnapore which was too far from the transmitting station to admit of absolutely satisfactory reception or satisfactory supervision. In the second case the local Government decided to maintain the sets themselves and as a result, the staff of All India Radio were cut off from all contact with the villages. In both cases the procedure is now being revised.

86. In the Punjab one of the chief results of the scheme was to show that the placing of receivers in villages at great distances from the transmitter resulted in an enormous wastage in funds. The Punjab Government had placed receivers as far as 60 miles north and 46 miles south of Delhi, the result was—to take these two examples—that a fault in either set necessitated a journey of 120 miles in one case and 92 in the other, and the expense incurred was out of all proportion to the service given. For this reason a different plan has been adopted for the Delhi scheme to which allusion will be made later.

87. In Madras the local Government have decided to proceed on their own initiative and have appointed a Radio Engineer attached to Govern-

ment. It is understood to be their intention to place community sets not only in villages but also in urban areas and municipal parks, as has already been done in Madras itself. It has to be remembered that the future of Indian Broadcasting may be undermined by free transmissions in urban areas if they adversely affect the sale of sets, and consequently the revenues of broadcasting. The experiment is not, however, far enough advanced, so far as we understand, to make any very definite statements about it at this point.

88. There are now in all about 100 community village sets working in India, and some experience has been gained in the type of programme which will appeal to the villager and the average cost of village broadcasting. The Research Department of All India Radio, has, moreover, evolved a type of village set which, with its batteries and time-switch, costs about Rs. 300.

89. Nevertheless, the present situation is not satisfactory. In the first place, experience has clearly shown that the economical working and proper supervision of rural broadcasting—so long as no electric power is available in villages—must be dependent, to a great extent, upon the concentration of sets in a comparatively small area where they can be served without difficulty by a charging unit and in an area which is not too far from the transmitter to prevent (*a*) good reception at all times of the year, (*b*) the proper supervision of mechanics by a technical staff, and (*c*) the essential contact with villages by a programme staff. It is doubtful whether, for the present, so many sets are likely to be available in any one area in India as to render it necessary to place them at great distances from the transmitter, and so long as sets are within a radius of, say, 20 miles of the transmitter, it should be possible for the staff to exercise proper supervision. It is, however, very necessary that the means for such supervision, *i e.*, transport, should be provided. It was only in Delhi that a fair degree of supervision could be exercised, and that only by the use of a special car for the purpose. Villages cannot be visited by train or tonga or other means of transport without such an immense loss of time as would make it impossible for regular visits to be made. This applies to sets placed within a radius of 20 miles of the transmitter. If for one reason or another a local Government desires sets to be placed at greater distances, and All India Radio concurs that at such distance they will be within the effective range of the transmitter concerned, a different arrangement will be necessary. It is possible to argue that, in time, rural broadcasting in India will have to be supervised by the local district officers and not by All India Radio, but it is doubtful whether such an argument would hold good for some time to come, at any rate so far as technical supervision is concerned. and the lack of contact between villages and programme staff which would inevitably occur under such an arrangement would be deplorable. An intensive scheme for rural broadcasting in the Delhi Province is now being established, and the 120 sets to be used in that scheme have been divided into five " circles " containing 24 sets each. A charging unit and a mechanic will be permanently installed at the centre of each " circle " and no set will be more than about 6 miles from a charging unit. A similar formula could be laid down in cases where a Provincial Government wished to place sets in some area at a considerable distance from the transmitter. Nevertheless, some system of supervision of the technical side by the Station Engineer and of the pro-

gramme side by the Rural Assistant, or Station Director, would have to be devised, and this would undoubtedly entail some increase in staff and some arrangement for additional travelling allowances.

90. Some indication has been given above of the difficulties which are likely to be met with in the development of rural broadcasting in the provinces. It is difficult to foresee the future and it may be that Provincial Governments will adopt entirely new views, *e.g.*, the Punjab Government at present considers that the free issue and maintenance of sets should be discontinued and the development of rural broadcasting left to the initiative of zamindars and even villagers themselves. It would be a happy solution, if it worked, but it is doubtful whether the time for it has yet arrived. Zamindars, in the experience so far gained, do not allow their sets to be used by villagers. Much cheaper sets and much greater interest in radio seem essential before such a policy can be effective. Under village conditions, however, and particularly in areas where electric power is not, and is not likely to be, available, the " cheap " set is unlikely to prove successful either from the point of view of intelligibility (of which the villager demands a high standard) or of wear and tear. It is hardly necessary to add that electric power would (and in certain places such as the U. P. tube well area does) automatically reduce the cost and solve most of the technical difficulties of rural broadcasting.

91. The general situation, then, as regards rural broadcasting may be viewed as follows :—The experiments made up to the present, have for various reasons, been limited and spasmodic. In 1935, when village broadcasting was started, there were not sufficient data available to show what difficulties were likely to arise or how far villagers would respond to radio. Today we may at least say that, in our experience, radio (after the first spasm of enthusiasm) attracts a *small* daily audience of villagers—to put it at the lowest, fifty in every thousand every day—and that great ingenuity and very considerable work is necessary to give sufficient variety to hold the villagers' attention and at the same time to " put across " the desired information and instruction. Further it is clear that the older villagers are and probably will remain, suspicious of radio, while children and younger folk are keen, and readily absorb information. It thus becomes a question whether All India Radio should modify its policy by decreasing the " volume " of sets (and thus cheapening them) and placing the receiver in a school rather than, as at present, in the open. (The original arrangement of a loudspeaker with a very large output was designed by Colonel Hardinge of Marconi's " in order that villagers might be able to listen in their houses ". This, in our experience is a fallacy : villagers never listen in their houses : either they come to the loudspeaker or they do not listen).

92. A brief account of the Rural Broadcasting schemes undertaken or supervised by All India Radio may be given here.

(i) Midnapore Scheme.

93. In 1935, Mr. P. J. Griffiths, then District Magistrate of Midnapore, drew up a tentative scheme of Rural Broadcasting His intention was to erect a transmitter with an effective range up to 70 or 100 miles to serve the villages in the Midnapore area and to run a local and independent service for this purpose. The Government of Bengal were prepared to

allot a sum of Rs. 82,000 for the erection of the transmitter and for fifty receivers in various villages in the Midnapore District.

94. It was, however, pointed out to Mr. Griffiths by the Controller that the fund was not nearly sufficient to serve his purpose. Even a small transmitter with an effective range of not more than 20 miles would have cost some Rs. 40,000, while the cost of fifty receivers would have amounted to another Rs. 40,000. Even thus, with a much restricted range, no funds would have been available for the upkeep and recurrent expenditure of the transmitter and the sets. The scheme was therefore abandoned and it was decided that some sets should be purchased, placed in the Midnapore area and served by the Calcutta Station as an experimental measure. Arrangements were accordingly made for the Indian State Broadcasting Service to erect and maintain on behalf of the Government of Bengal 15 receivers in the Midnapore District.

95. The type of receiver used was Community Receiver No. 207, the latest model of Marconiphone of that time. A small godown was rented at Midnapore where a charging plant and necessary arrangements for charging and storing batteries were set up. All batteries were taken by the men in charge of the village set to the nearest bus. The charging plant was located in close proximity to the bus terminus at Midnapore

96. The Government of Bengal sanctioned the expenditure of a sum not exceeding Rs 17,000 on the purchase, erection and maintenance over a six months experimental period of the 15 radio receiving sets for the work of rural uplift.

97. The fifteen sets were originally located in the following villages :—

Name of village.	Distance from Midnapore.
1. Amalhanda	40 miles.
2. Dhalhara	44 ,,
3 Lalugeria	30 ,,
4. Darna	68 ,,
5. Potashpur	47 ,,
6. Janka	78 ,,
7. Balighai	44 ,,
8. Irphala	36 ,,
9 Baliharpur	40 ,,
10 Chandrokona	20 ,,
11 Anandapur	14 ,,
12 Lowada	28 ,,
13 Pingla	30 ,,
14. Mohanpur	50 ,,
15. Khelar	20 ,,

98 On the 31st March 1936 the following staff for the Midnapore Scheme was sanctioned by the Government of Bengal :—

	Rs.
1 Menial	80 per month.
1 Mechanic	40 per month.
1 Village Inspector	20 per month.

99. The rural broadcasting programmes from Calcutta having proved successful and the maintenance of the receivers economical the Station Director suggested to the Government of Bengal that as funds were available, the six months' open period originally sanctioned might be extended to 8 months. This was eventually sanctioned and the receivers were kept in the villages up to the end of May 1937.

100. At the end of that period they were all brought to Midnapore where they were stored for the rainy season. The Inspector was left at Midnapore in charge of the sets. On the whole the sets during the period worked satisfactorily but it was found necessary to have some of the Rotary Transformers rewound and repaired.

101. The District Magistrate decided that when the sets were sent out again it would be more economical and advisable to erect them in 15 other villages nearer to Midnapore. This he felt would give others the opportunity of listening to the programmes and being nearer would enable him to visit the sets more frequently and keep a better check on their operation. Consequently on the 1st of October 1937, the Inspector received instructions to erect the sets in the 15 villages shown in the list below. The work of re-installation commenced on the 1st October 1937 and was completed by the 15th October 1937.

Revised scheme of Village Radio set centres.

Serial No.	Name of Village, Union & P. O.	Name of Custodian.	Distance from Midnapore.
1	Deuldanga, Union II of P. S. Midnapore.	Maulvi Abu Ahmed, Chairman, Chandra Debt Settlement Board.	14 miles.
2	Pathra, Union III of P S. Midnapore. P O. Br. Janadhaupur.	Babu Manya Prakash Banerjee, President, Pathra U. B.	7 ,,
3	Panchkuri, Union VI of P. S. Midnapore.	Babu Abinash Ch. Senapati ..	5 ,,
4	Anandapur, Union X of P. S Keshpur, P. O. Anandpur.	Babu Ananta Ch. Bag, President. Anandapur U. B (Zamindar).	14 ,,
5	Kalagram, Union XII of P. S. Keshpur.	Babu Ramgati Chakravarty, President U. B	15 ,,
6	Salboni, Union IV of P. S. Salboni P. O. Salboni.	Secretary, Salboni Club ..	15 ,,
7	Satpati Hari Mandap, Union IX of P. S. Salboni P. O	Babu Sarada Charan Chakravarty, Member, D. S. Board.	13 ,,
8	Godapiasal, Union XIII of P S. Salboni P. O., Godapiasal.	Kazi Ali Ahmed, P. P. .	8 ,,
9	Gurguriapal, Union III of Midnapore.	Babu Murarji Thaakur, Member, Manidhaha D. S. B.	8 ,,
10	Talkui, Union V of Midnapore ..	Babu Khudiram Mondal, President	2 ,,
11	Debra, Union V of P. S. Debra .	Babu Ashotosh Maity, President.	17 ,,

Serial No.	Name of Village, Union & P. O.	Name of Custodian.	Distance from Midnapore
12	Amrakuchi, Union IX of P. S. Keshpur	Babu Ramapada Tripathy, President	8 miles.
13	Munibgarh, Union X of P O. Kharagpur Rural.	Babu Bejoy Krishna Bhuniya, President, U B and Chairman, D S. Board	10 „
14	Dhitpore, Union VIII of P S Kharagpur Rural.	Babu Nieendra Bejoy Pal, Member, U B.	10 „
15	Khelar, Union VI of P. S. Kharagpur, Rural P. O. Banapur.	Babu Ramesh Chandra Senapati, Zemindar.	15 „

102. During 1938-39, the location of some of these sets was again changed and the group was sited as follows :—

Serial No	Name of Village	Name of Person in Charge of Receiver.	Distance from Midnapore.
1	Bhabanipore	Babu Budhandra Nath Dutta .	24 miles.
2	Mazurhatti	Kazi Ali Asgar .. .	17 „
3	Dhelhara	Lalit Mohan Mahapatra ..	12 „
4	Chandra	Tehsildar, Midnapore Zamindari Co	12 „
5	Kamalapore	Ditto ditto ..	7 „
6	Salboni	Mati Lal Roy .. .	15 „
7	Maupal	Munshi Enayetullah Mullick . ..	11 „
8	Munibgarh	Bejoy Krishna Bhuriya .	10 „
9	Satpati	Sarada Charan Chakravarty ..	13 „
10	Chandrakena Road	Head Master, Chandrakena, M.E School.	24 „
11	Gopalpore	Amrita Lal Pal	26 „
12	Dhitpore	Nisendra Bejoy Paul	10 „
13	Dwarki Kapore	Bhusan Chandra Dey	16 „
14	Talkui	Khudiram Mandal .. .	2 „
15	(Not Working).		

103. The progress of expenditure (excluding depreciation) out of the Government of Bengal's first Rural Uplift grant for the Midnapore Wireless Transmission Scheme is shown below :—

Amount sanctioned .. .. Rs. 17,000

Items of Expenditure.	1936-37.	1937-38.
Cost of 15 receivers and batteries	10,770	..
Establishment	1,004	1,249
License Fees	150	150
Rent	90	194
Travelling allowance to Staff	212	342
Maintenance of batteries and other Miscellaneous ..	140	621
	12,366	2,556
Total for the two years ..	..	14,922
Balance carried over for the year 1938-39 ..	..	2,078
	Total ..	17,000

104. A further sum of Rs. 870 was sanctioned for 1938-39 and the total amount was spent as follows :—

	Rs.
Establishment	1,311
Travelling Allowance	550
Maintenance, etc.	228
License Fees	140
Repairs, transport and miscellaneous ..	508
Balance	211
Total ..	2,948

(ii) Punjab Rural Scheme from Delhi

105. During 1935-36, the Punjab Government decided to make use of the newly erected Station at Delhi for village broadcasting and to that end proposed to equip some of the Punjab villages in the districts adjoining Delhi, with receiving sets. For this purpose a sum of Rs. 48,040 was sanctioned by them to be spread over a two year experiment and was placed

under the administrative control of the Station Director, Delhi, to be spent according to the following sub-heads :—

	Rs.
Purchase of sets	17,000
Maintenance of sets	14,600
Programme expenditure	16,440
	48,040

106. Twelve sets were purchased and sited in the following villages selected by the Punjab Government :—

Village.	Distance from Delhi.
1. Bhalot	52 miles.
2. Murthal	28 ,,
3. Larsoli	31 ,,
4. Kohand	60 ,,
5. Siwah	50 ,,
6. Karhans	46 ,,
7. Patti Kalyana	40 ,,
8. Bhundsi	23 ,,
9. Pirthala	30 ,,
10. Sikri	25 ,,
11. Jharsaintly	22 ,,
12. Ajraunda	18 ,,

107. The charging unit was installed at Delhi itself and a glance at the magnitude of distances will indicate the difficulty involved in the maintenance of sets. The provision of a lorry for the transport of sets was helpful but even with this facility the problem of maintaining the sets efficiently and of attending to necessary repairs or sudden breakdowns with the least possible delay remained unsolved. The village programme was broadcast for one hour every evening, but the task of programme organization proved unexpectedly difficult because the work of writing and producing an hour's programme every day required the whole time attention of two or three programme assistants who could not be spared from general programmes whose duration was already in the neighbourhood of 8 hours a day.

108. As a partial solution of this difficulty the Punjab Government appointed one and, later on, two rural programme assistants at Rs. 100 per mensem who were responsible for their work to the Punjab Government, but were placed under the administrative control of the Station Director, Delhi. This arrangement continued up to the end of March 1938 by which time the Lahore Station had already been in operation for 3½ months. At the end of 1937-38, the rural sets owned and maintained by the Punjab Government were transferred to the vicinity of Lahore and

the Punjab staff, as well as the balance of funds were similarly placed under the administrative control of the Station Director, Lahore.

109. The following is the statement of expenditure of the Punjab Rural Broadcasting Fund :—

Total allotment .. .. Rs. 48,040.

Items of Expenditure.	1935-36.	1936-37.	1937-38	1938-39. (April and May.)
Purchase of sets . ..	..	14,401 13 0	543 4 0	..
Maintenance	..	6,796 1 0	3,620 10 6	.
Establishment . ..	554 13 0	8,150 0 3	5,550 9 9	1,433 11 0
Total ..	554 13 0	29,347 14 3	9,714 8 3	1,433 11 0

Total expenditure .. .. .. Rs. 41,050-14-6.
Balance transferred to the Station Director, Lahore Rs. 6,989-1-6.

(iii) *The Delhi Province Rural Scheme.*

110. When the installation of the Lahore Radio Station and the consequent removal of the Punjab Government receiving sets from the vicinity of Delhi to that of Lahore was within sight, it seemed more than probable that the Delhi Station would soon be left without any opportunities of carrying on its activities in the field of rural broadcasing. Delhi had hitherto given a good deal of its time and attention to the organization of village programmes and because of its location at the Headquarters of the broadcasting organisation was in a position to give a lead to other stations. Furthermore, one of the main problems upon which the attention of the Research Department of All India Radio had been engaged was the development of a suitable village receiver, that is, a receiver which would be convenient and inexpensive enough to be adopted on a large scale throughout India. With this end in view, experiments had been in progress for some time and considerable work had been done. But it was felt that to achieve the desired amount of success it was essential that the Research Department should be in close touch with village receivers operating under working conditions. It was, therefore, desirable, from the point of view of experiment and research that Delhi should continue to be the centre of experiments in rural broadcasting. Past experience had pointed to the necessity of an experimental scheme of rural broadcasting with a sufficiently large number of receivers, entirely within the control of All India Radio and properly supervised and situated within a small area. Consequently, a scheme for rural broadcasting in the Delhi Province, extending over a period of 3 years, and costing one lakh of rupees, was submitted to the Government of India and was sanctioned by them in December 1937. The scheme, however, could not be taken in hand till 1938-39, owing to the difficulty of preparing 120 sets within the time at the disposal of the Research Department.

111. The details of allotment for the year 1938-39 were as follows :—

	Rs.
I. Pay of Establishment	6,120
II. Other charges—	
(a) Initial expenditure on sets, charging units and car	45,800
(b) Maintenance of car for 9 months ..	3,150
(c) Maintenance of charging unit for 7½ months	1,900
(d) Maintenance of sets for 7½ months..	1,500
(e) Contingencies	1,050
Total ..	53,400
Grand total ..	59,520

112. The new scheme which was inaugurated on the 16th October 1938, by The Hon'ble Mr. E. M. Jenkins, Chief Commissioner of Delhi, aims at covering the entire Delhi Province with a net-work of receiving sets. The scheme altogether provides for the installation of 120 receiving sets which it is proposed to put up in the more populous of the 381 villages in the Delhi Province, so that almost every village with a population of 600 or above will be catered for. For purposes of technical maintenance of these receivers, the Delhi Province has been divided into five circles or zones, *viz*. Najafgarh, Nangloi, Narela, Mahrauli and Delhi, in each of which it is proposed to instal a Charging Unit. This will bring every village within a distance of 6 to 8 miles from a Charging Unit and will render the regular maintenance of sets possible even during the rains when road conditions are not favourable.

113. Work in the Delhi circle has already been completed and receivers have been installed in the fifteen villages given in the list below. These villages were selected in consultation with the Chief Commissioner, Delhi Province.

Statement showing the villages where Radio Sets are Installed.

No.	Name of the Village.	Mileage from Delhi.	Population.	Site Selected.	Name and Designation of the Caretaker.
1	Jhil Kulanja ..	4	600	Pt. Chitrumal's Baithak	B. Ali Ahmad, Supervisor, Keventer Dairy Farm. Pt Chitrumal, Shopkeeper.
2	Silampur ..	5	554	Chopal cum. School ..	Ch. Tirkha Ram, Zamindar. Master Karan Lal, School Teacher.
3	Gokalpur ..	6	500	Pt. Nathuram's Baithak	Pt. Nathu Ram, Zamindar. M. Vas Deo, Munshi.
4	Ghonda .	5	1,000	Kalan's Baithak ..	Kalan Lambardar. Ch. Mangal Singh

No.	Name of the Village	Mileage from Delhi.	Population.	Site Selected	Name and Designation of the Caretaker.
5	Wazirabad ..	4	430	Balwant Singh's Baithak	Balwant Singh, Shopkeeper. Jagannath
6	Jagatpur ..	5	729	Chopal cum School ..	Balramji, Zaildar. Master Durga Parshad, School Teacher.
7	Barari ..	7	1,431	Ch. Desraj's Baithak ..	Ch. Desraj Sufadposh. Manphool Singh.
8	Libaspur ..	8	400	Har Narain Singh's Baithak.	Har Narain Singh, Lambardar. Manphool Singh.
9	Shamapur ..	8	915	Chopal	Ramji Lal, Lambardar. Hardey Ram.
10	Badli ..	8	1,612	Chopal	Ch Tara Singh, Zamindar Ch Sultan Singh.
11	Rampura ..	6	600	Chopal	Ch. Chunni, Lambardar. Pt. Nathu Ram
12	Basai Darapur	6	1,125	Chopal	Ram Singh Ram Chander.
13	Shadipur ..	7	300	Prabhu Dutt's Baithak..	Pt. Prabhu Dutt, Moneylender. His Brothers.
14	Okhla ..	9	416	Chopal	Naider Lambardar.
15	Kilokri ..	7	1,156	Chopal	Edu Lambardar Din Mohd and Karamdin

114. The charging unit for this circle has been installed at the All India Radio Transmitting Station, Kingsway, Delhi. It may be mentioned here that where the distance from the centre of the circle exceeds 6 or 7 miles, the village is situated on the main road and therefore the longer distance does not affect its accessibility.

115. The sanctioned staff for the scheme is as follows :—

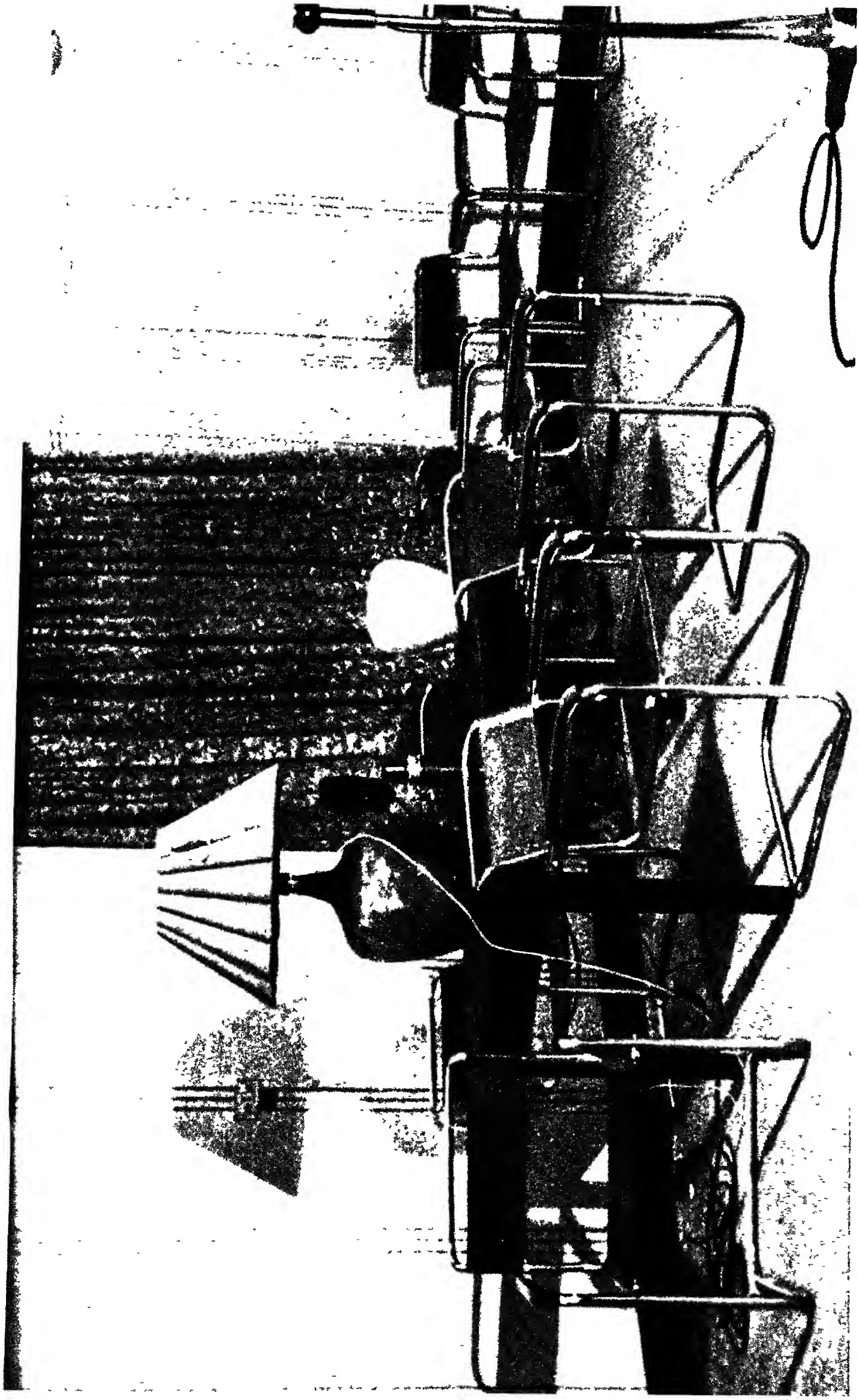
1. Inspector (one) at Rs. 250 p. m.
2. Technical Supervisors (five, one for each zone) at Rs. 70 p. m.
3. Driver (one) at Rs. 40 p. m.
4. Clerk (one) at Rs. 40 p. m.

Of these, the following have already been appointed :—

One Inspector.
One Clerk.
One Driver.
One Technical Supervisor (for the Delhi zone).

116. The following expenditure was incurred during 1938-39 :—

	Rs.
Pay of Establishment	2,263
Other Charges—	
(a) Travelling Allowances	38
(b) Initial expenditure on account of sets, charging unit and the car ..	25,078
(c) Maintenance of car	775
(d) Maintenance of sets and charging units	29
(e) Contingencies	267
Total ..	28,450



(iv) *Bombay.*

117. In April 1937, the Bombay Government purchased 18 village sets and installed 16 of them in the following villages :—

Thana District.

Name of Village	Approx. distance from Bombay.
1. Kon	30 miles.
2. Washind	50 ,,
3. Wada	60 ,,
4. Umroli	70 ,,
5. Belapur	40 ,,
6. Murbad	50 ,,
7. Raita	40 ,,

Kolaba District.

1. Khalapur	50 ,,
2. Taloja	40 ,,
3. Palaspa	45 ,,
4. Funde	20 ,,
5. Washi	35 ,,
6 Gadab	40 ,,
7. Chondi	25 ,,
8. Poynad	35 ,,
9. Utekhol	Not known.

118. Two sets were kept foı emergency replacements. The Bombay Government appointed a Director of Rural Programmes and a technical staff consisting of two mechanics. The latter were placed under the direct supervision of the Collector of Thana and the Bombay Station was asked to give an hour's programme in Marathi every day except Sundays. The conduct of the programme was entirely in the hands of the Director of Rural Programmes appointed by the Bombay Government although the programme was financed by All India Radio.

119. This arrangement did not prove efficient. The programmes were unattractive and the sets were seldom found in working order. Besides, the sets were placed in an area which was outside the effective range of the Bombay Mediumwave Transmitter. These facts were brought to the notice of the Bombay Government and eventually the Bombay Government decided—

(*a*) to transfer all the battery sets to Bombay and Bombay Suburban District in order to bring them within the mediumwave area and to instal them in the chawls there ;

(*b*) to place the technical staff under the direct supervision of the Director and to consider the possibilities of giving adequate clerical staff and other facilities to ensure a successful programme for the villagers of the Bombay Presidency ;

(*c*) to appoint a Director of Rural Programmes and an Assistant Director on a salary of Rs. 170 and Rs. 110 respectively ;

(*d*) to instal radio sets in as many as possible of the 48 electrified taluka towns. These will be intended for the benefit of the agriculturist residents and agriculturist visitors to these towns.

120. The question of appointment of the two officers mentioned above is receiving the immediate attention of the Bombay Government and it is hoped that the revised scheme will come into operation shortly.

121. A list of the taluka towns, etc., for which licences for electric supply have been granted is given below :—

District.	Taluka towns.	Other towns in the taluka.
Northern Division.		
1. Ahmedabad	Ahmedabad.	
	Viramgam.	
2. Kaira	Nadiad.	
	Kapadwanj.	
	Anand.	
3. Broach and Panch Mahals	Godhra.	
	Broach.	
	Dohad.	
4. Surat	Surat	Rander (Chorasi taluka).
	Bulsar.	Udwada-Wapi* (Bulsar taluka).
5. Thana	Thana.	
	Kalyan	
	Bhiwandi.	
	Bassein.	
6. Bombay Suburban ..	Bandra ..	Kurla, Ghatkopar, Chembur and Khar, Santa Cruz Vile Parle, Andheri, Goregaon, Malad, Borivli.
Central Division.		
7. Ahmednagar	Ahmednagar.	
	Sangamner.	
8. East Khandesh ..	Jalgaon.	
	Bhusaval.	
	Chopda*.	
	Amalner.	
	Chalisgaon.	
9. West Khandesh ..	Dhulia.	
	Nandurbar.	
10. Nasik	Nasik.	
	Sinnar.	
	Igatpuri* ..	Manmad (Nandgaon taluka).
	Malegaon.	
	Yeola.	
11. Poona	Poona City ..	Baramati (Bhimthaditaluka).
	Junnar*.	
		Lonavla-Khandala (Maval taluka).
		Talegaon* (Maval taluka).
12. Satara	Wai.	
	Mahabaleshwar ..	Panchgani (Wai taluka).
13. Sholapur	Sholapur.	
	Barsi.	
	Pandharpur.	

**Note*.—At places marked with an asterisk the supply of electric energy is not yet available.

District.	Taluka towns.	Other towns in the taluka.
Southern Division.		
14. Belgaum	Belgaum .. .	Nipani (Chikodi taluka).
15. Bijapur	Bijapur.	
	Bagalkot	Ilkal (Hungund taluka).
16. Dharwar	Dharwar	Haveri (Karajgi taluka).
	Ranebennur*	Byadgi* (Ranebennur taluka).
	Gadag.	
	Hubli.	
17. Kolaba	Panvel	Khopoli (Karjat taluka).
	Mahad*.	Matheran (Karjat taluka).
18. Ratnagiri	Ratnagiri*.	

**Note*.—At places marked with an asterisk the supply of electric energy is not yet available.

(v) *Madras.*

122. The Madras Station of All India Radio began to broadcast rural programmes on the 1st November 1938. A list of the villages in which receiving sets have been installed by the Government of Madras is given below :

Name of District.	Name of Village.
Salem	Attur.
	Krishnagiri.
	Dharmapuri.
	Rasipur.
	Namakkal.
	Taramangalam
	Komarapaliam.
	Idapadi.
North Arcot	Ambur.
	Jalarpet.
	Ranipet.
	Arni.
	Kaveripakkam.
	Arkonam.
	Trivellore.
South Arcot	Nellikuppam.
	Kallakurichi.
	Mannargudi.
	Vanur.
	Pannadam.
Tanjore	Kuttlam.
	Muthupet.
	Nannilam.
	Papanasam.
	Trivadi.
Chinglepet	Sembiam.
	Ikkad.

Name of District.	Name of Village.
Chittoor	Palmaner.
	Tamballapalle.
	Kalkiri.
	Chandragiri.
Cuddapah	Chennur.
	Badvel.
	Siddavattam.
	Kodur.
West Godavary	Kovvali.
Nellore	Gudur.
	Kavali.
	Udayagiri.
	Kandukur.
	Atmakur.
	Totapalligudur.
Guntur	Takkellapad.
	Pedaravur.
	Repalle.
	Anantavaram.
	Ammanabrole.
Kistna	Pedasanagallu.
	Gannavaram.
	Gundlavallem.
	Kolavennu.
	Pedana.
Madura	Theni.
Ramnad	Sivaganga.
	Aruppukottai.
	Manamadura.
Tinnevelly	Melapalayam.
Trichinopoly	Musiri.
	Kulitalai.
Coimbatore	Gobichettipalayam.
	Kunnathur.
	Anamalai.

123. The siting, supervision and maintenance of these sets is under the direct control of the Government of Madras who have appointed their own engineering staff for this purpose. No contribution is made by the Provincial Government towards the cost of the programmes.

(*vi*) *Lahore.*

124. Mention has been made earlier in this Section of the transfer of the Punjab Rural Broadcasting Scheme from Delhi to Lahore. Figures of expenditure for 1938-39 after the transfer of the Scheme to Lahore are given below :

	Rs.
Pay of Establishment	2,602
Travelling Allowances	69
Contingencies	2,129
Total	4,800

125. Full details with regard to the siting of these sets are not available as they are under the control of the Punjab Government. The Montgomery District Board has, however, installed 34 sets in the District and a list of these is given below :

Village.	Distance of the villages from the District Headquarters
1. Basir Pur	25 miles.
2. Sher Garh	45 "
3. Qabula	40 "
4. Bunga Hayat	42 "
5. Malka Hans	22 "
6. 45|12-L.	36 "
7. 89|6-R.	3 "
8. 73|5-L.	13 "
9. Nur Shah	14 "
10. Sadar Gogera	37 "
11. Kanowal	36 "
12. 32|2-L.	34 "
13. Satghara	34 "
14. 168|9-L.	45 "
15. Bamanbala	44 "
16. Hujra	53 "
17. 8|11-L.	23 "
18. 64|4-R.	14 "
19. 96|12-L.	45 "
20. 40|3-R.	29 "
21. Akbar	21 "
22. 269|E.B.	52 "
23. 127|E.B.	43 "
24. Tughril	63 "
25. 34|4-L.	21 "
26. Haman	45 "
27. Jethpur	60 "
28. 58|5-L.	12 "
29. 39|14-L.	42 "
30. Cagoo	43 "
31. Harrapa	15 "
32. 74|4-R.	11 "
33. Haveli	55 "
34. Depal Pur	40 "

(*vii*) *Peshawar.*

126. When the Government of India took over the Peshawar Station in April 1937, a certain number of villages in the N. W. F. P. were already equipped with receivers, maintained by the Provincial Government. During 1937-38 the Government of the N. W. F. P. placed the following amounts

at the disposal of the Station Director, Peshawar, for rural broadcasting :

	Rs
(1) Cost of maintenance of 15 receiving sets at Rs. 150 per set	2,250
(2) Contribution towards village programmes at Rs. 170 p. m. from 1st November 1937 to 31st March 1938	850
(3) Contribution on account of pay of translator at Rs. 70 p. m from 1st November 1937 to 31st March 1938 ..	350
Total .	3,450

The expenditure during 1937-38 amounted to Rs. 2,940 as follows :—

	Rs.
Maintenance of sets	2,036
Programmes	904
	2,940

and during 1938-39 the allotment made by the Government of N. W. F. P as well as the expenditure was as follows :—

	Rs.
Maintenance of sets	2,250
Maintenance of Rural Programmes	2,040
	4,290

127. The sets are located as follows :—

Name of Village.	Distance from Peshawar.
1. Tangi	33 miles.
2. Chamkani	7 "
3 Badaber	8 "
4. Takhtbai (Choha Village)	54 "
5. Sheikh Mohammadi	8 "
6. Nawshera	27 "
7. Pabbi	14 "
8. Charsadda	19 "
9. Utmanzai	22 "
10. Matta Moghal Khel	24 "
11. Shabkadar	19 "
12. Mathra	8 "
13. Umarzai	25 "
14. Sheikhan	11 "

128 Besides these sets which belong to the N. W. F. P. Government there are about 33 sets owned by the various District Boards of the Province as below :—

Peshawar District

1. Dargai
2. Pirpai.
3. Nahkai.
4. Rajjar.
5. Tarnal.
6. Zaida.
7. Betagram.
8. Togi.
9. (Spare).

Hazora District.

1. Abbotabad.
2. Manshera.
3. Khalabet.
4. Sarai Salah.
5. Kotnajibullah.
6. Touring Dispensary.

Bannu District.

1. District Courts of Bannu.
2. Sarai Naurang.

Kohat District.

1. High School, Lakki, Marwat.

(viii) *Lucknow.*

129. No rural programmes are as yet being given from this station, but the Provincial Government have recently purchased and are in process of installing, 80 sets. Rural broadcasting from Lucknow will be started as soon as this installation has been completed.

130. The details of the village programme from the various stations of All India Radio are given in the following statement :

Statement showing details of Village Programmes Broadcast from the Stations of All India Radio (1938-39.)

Station.	Time.	Medium or Short Wave.	Days on which Programme is given.	Language in which given.	Remarks.
Delhi ..	7 15—8-00 P.M.	M. W. only ..	All days except Wednesday (Relay day).	Hindustani.	
Bombay ..	6-30—7-30 P.M. (For the Bhumijan).	M. W. only ..	All days except Saturday. (Relay day).	Marathi.	
Calcutta ..	5-00—6-00 P M. ..	M. W. and S. W.	Monday, Wednesday, Thursday and Saturday.	Bengali	No programmes during May—September.
Madras ..	6-00—6-30 P.M. ..	S. W. only ..	Monday, Wednesday and Friday.	Telugu.	
			Tuesday, Thursday and Saturday.	Tamil.	
Lahore ..	6-30—7-15 P.M. ..	M. W. only ..	All days	Hindustani and Punjabi.	
Peshawar ..	7-00—8-00 P.M. .. (Khabare Atare).	M. W. only ..	All days	Pushto.	

SECTION 10.

Miscellaneous.

131. The more important types of items in the broadcast programmes of All India Radio have been discussed in detail in the preceding sections of this chapter. This account, however, should not be closed without some reference to outside broadcasts, feature programmes and S.O.S. and Distress messages. A brief account of these is given below.

(i) Outside Broadcasts.

132. Outside broadcasts have been, and are increasingly, one of the most popular broadcast items in the West. In England, racing, football, cricket, boat-races, tennis, ceremonial parades and many other occasions such as the launching of ships, the inspection of fleets, banquets and public speeches, Royal weddings, visits of statesmen and Royalty, all provide continual opportunities for outside broadcasts. Distances are comparatively short and telephone connections so good that satisfactory transmission can always be obtained A large staff of experienced commentators has been built up and plenty of funds are available for the employment and travelling allowances of commentators, programme and technical staff for each and every occasion. In India, the case is a very difficult one. Occasions of wide and general interest are not so common. Interest in football or cricket, for instance, is generally limited to a comparatively small area ; although the interest taken, for instance, in the cricket commentaries from Bombay, shows that there may be a wide field for development in this respect. Ceremonial occasions of general interest are few. Political meetings for obvious reasons cannot be broadcast. Funds are restricted. Lines over great distances are apt to prove inadequate and in many cases no lines are available Thus the possibility of outside broadcasts in India is at present somewhat restricted. Amongst the outside broadcasts undertaken since January 1938 the following may be mentioned :—

Delhi.

1. Commentary on the Horse and Cattle show.
2. Polo Tournament from Durbar Grounds.
3. All India Women's Hockey from Lady Hardinge Park.
4. Commentary on the Kumbh Fair, Hardwar.
5. Urs from Piran Kalyar Sharif.
6. Urs from Dargah Hazrat Nizamuddin.
7. Arti from Muttra—Janma Ashtmi Celebrations from Muttra.
8. Tan Sen Urs from Gwalior.
9. A Poetical Symposium from Dargah Hazrat Nizamuddin, Delhi.
10. A running Commentary on the opening ceremony of the Sanatan Dharma Mandir, New Delhi.
11. All India Music Conference, Meerut.
12. Running Commentary on the final of the Vizianagram Football Tournament.

Bombay.

1. Proceedings of the Marathi Literary Conference.
2. Proceedings of the Population Conference.
3. Bombay University Convocation.
4. Abdul Karim Khan Anniversary from Miraj.
5. Commentary on the Pentangular Cricket Tournament.
6. Running Commentary on the Finals of the Aga Khan Hockey Tournament relayed from the Bombay Gymkhana ground.
7. A relay from the Wagle Memorial Hall of a concert given by Pt. Omkarnath under the auspices of the Music Circle.
8. A relay from the Cowasji Jehangir Hall of the 4th concert of the Bombay Symphony Orcheshal Society.
9. A relay from the Bombay Music Circle of a programme by Abdul Karim Khan of Delhi.
10. Running Commentaries from Chowpathy and Ballard Bunder on "Navali Pournima" (Cocoanut Day).
11. A running commentary on the Finals of the Rovers Cup Football Tournament.

Calcutta.

1. Cricket Matches from Eden Garden.
2. Commentary from the Calcutta Race Course.
3. Commentary on the Boxing Contest from Fort William.
4. Calcutta University Convocation Address by Dr. Rabindranath Tagore.
5. Performance from the Madan Theatre.
6. Football Commentary from the Calcutta Football Club Grounds.
7. Birth-day Message by Dr. Rabindranath Tagore from Kalimpong.
8. Immersion Ceremony from the Ahiritola Ghat, Calcutta.
9. Performance and Armistice Day Relay from the Great Eastern Hotel.
10. "Career" Lectures from the Ashutosh Hall.

Madras.

1. Radio Exhibition.
2. All-India Swadeshi Exhibition.
3. Annual Indian Musical Conference.
4. Madras European Musical Association concert.
5. Connemara Orchestra.
6. Adyar Boat Club All-India Regatta.

Lahore.

1. Punjab University Boat Race.
2. Opening of the Punjab Legislative Assembly
3. Opening of the Indian National Science Congress.
4. Mushaira from Bazam-i-Urdu, Simla.
5. Ranji Trophy Cricket Final, Patiala.

133. It may be noted here that Mushairas or Kavi Sammelans provide the most popular material for this type of broadcast treatment. As many as 36 Mushairas or Kavi Sammelans have been put on the air by the Delhi, Peshawar and Lahore stations of All India Radio, most of which were outside broadcasts and from places as distant as Meerut, Simla and Bhopal. The languages used were Urdu, Hindi, Punjabi and Pushto For those who are not familiar with this type of poetical symposium, common in Northern India, it may be mentioned that a Mushaira or a Kavi Sammelan is a gathering in which poets recite their own verses generally composed specially for the occasion. This is done either round a common metre and rhyme-scheme or round a common theme which lends zest to the occasion by introducing a competitive flavour in the performance. Each poet makes his appeal directly to the audience and since the audience is for the moment the final judge of his merit, the poet is called upon to employ the best method of recitation which lies within his power. The gathering conveys its approval by applause and its disapproval by silence or worse. The congregational nature of such functions, the variety provided by a large number of successive speakers within a brief space of time, the spontaneity and the element of surprise in the proceedings, combined together make a very tempting sound picture. It is, therefore, not surprising that this feature of Indian socio-literary life has been heartily welcomed by broadcasting. Such broadcasts have proved very popular and literary societies, associations, conferences, religious institutions and schools have willingly co-operated in arranging and organising them.

(*ii*) *Feature Programmes.*

134. A description of feature programmes has already been given in the footnote to paragraph 36. The feature programme, as we have said, has been greatly developed in the West. It cannot, however, be expected that such programmes should be attempted as yet in India on a grand scale by staffs recruited only in 1935. Apart from that consideration the equipment for such programmes—listening rooms, speak-back units, faders, and outside broadcast facilities—has so far been largely lacking. Nevertheless, a very considerable amount of work has been done in this direction

(iii) S. O. S. and Distress Messages.

135. S O. S. messages from persons who are dangerously ill and details for the tracing of lost persons are also broadcast as often as received. The main features of the forms required to be filled in each case are given below :—

I. *Details required for broadcast S. O. S. messages*—

1. Full name of person it is desired to find
2. How long ago and in what district was this person last heard of ?
3. Have all other means of tracing this person, for instance through the Police or Post Office, been tried ?
4. Full name of the patient.
5. Address at which the patient is lying dangerously ill.
6. What is the relationship between the person it is desired to find and the patient ?
7. Is the patient asking to see this relative ?
8. Name and address of the doctor attending the patient.
9. Is the applicant a relative of the patient ?
10. Applicant's full name and address.
11. Other occupations.

II. *Details required for the tracing of lost persons*—

1. Full name of lost person.
2. How long ago and in what district was this person last heard of ?
3. Have all other means of tracing this person, for instance, through the Police or the Post Office been tried ?
4. A brief description of the lost person :—
   (*a*) Age and Sex.
   (*b*) Height.
   (*c*) Build and constitution.
   (*d*) Complexion and cast of face.
   (*e*) Mother tongue and other languages spoken.
   (*f*) Any distinguishing features or marks.
5. Suggestions regarding his probable whereabouts.
6. Whether any reward is offered, if so, how much ?
7. What is the relationship between the lost person and the person who wishes the distress message to be broadcast ?
8. A brief report on the circumstances (if known) under which the person disappeared.
9. Applicant's full name and address.
10. Magistrate's certificate.

136. The total number of S. O. S. and Distress messages broadcast during 1938-39 was 130.

SECTION 11.

A Note on Languages.

137. There are many circumstances peculiar to India which add considerably to the difficulties of broadcasting in this country. The distances are vast. The nine stations proposed under the present scheme look very few and far between. The desire for listening to a number of distant stations creates a bias against the less expensive mediumwave receiver and retards sales and development in general. Purchasing power is low and a radio set beyond the means of the majority. The bulk of the population lives in villages where electricity is unknown and whose contact with the towns is distant and vague. Literacy level is low, entertainment tradition is by no means strong, the average range of interests is limited. Listeners are not easy to amuse and programme talent is hard to come by.

138. A major difficulty still remains to be mentioned and that is the multiplicity of languages.

139. The choice of language(s) to be broadcast from a given station would obviously be determined by considering, first, the language(s) used in its vicinity and, secondly, the language(s) used in the area covered by it. The first would indicate the language(s) for which programme material, programme talent, plays, talks, actors, speakers, etc, are easily available and the second, the demands made by the listeners

140 Two linguistic maps of India—one for Aryan and the other for non-Aryan languages prevailing in the country—are reproduced here from the Imperial Gazetteer of India From these it will be seen that linguistically, the stations are disposed as follows :—

Station.	Language(s) spoken in the vicinity.	Language(s) not commonl spoken in the neighbourhood but demanded by the listeners.
Peshawar ..	English, Pushto and other dialects of the N. W. F. P.	Hindustani.
Lahore ..	English, Punjabi	Hindustani.
Delhi ..	English, Hindustani ..	Tamil and Bengali.
Calcutta ..	English, Bengali . ..	Hindustani, Assamese, Oriya.
Lucknow ..	English, Hindustani.	....
Bombay ..	English, Gujerati, Marathi, Hindi.	Hindustani, Sindhi, Konka Canarese.
Madras ..	English, Telugu, Tamil ..	Singhalese, Canarese, Malayalam.

The demands made upon the shortwave stations with their wider range are naturally greater than those made upon the mediumwave stations.

141. A glance at the table shows that if the existing stations are to satisfy all their listeners, they should be broadcasting in the following languages :—

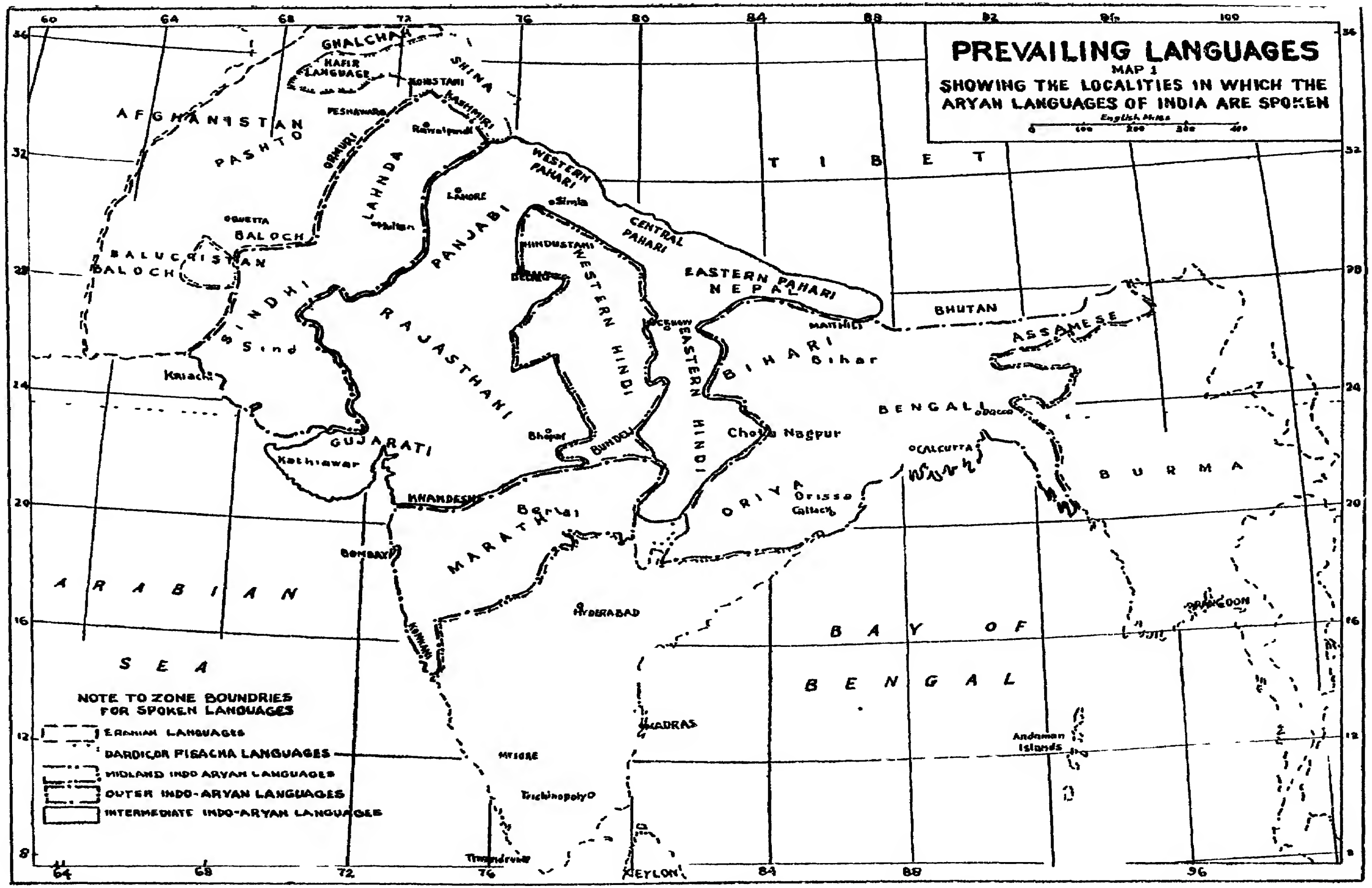
English.	Marathi.	Konkani.	Assamese.
Hindustani.	Tamil.	Canarese.	Oriya.
Bengali.	Telugu.	Pushto	Singhalese.
Gujerati.	Sindhi.	Punjabi.	Malayalam.

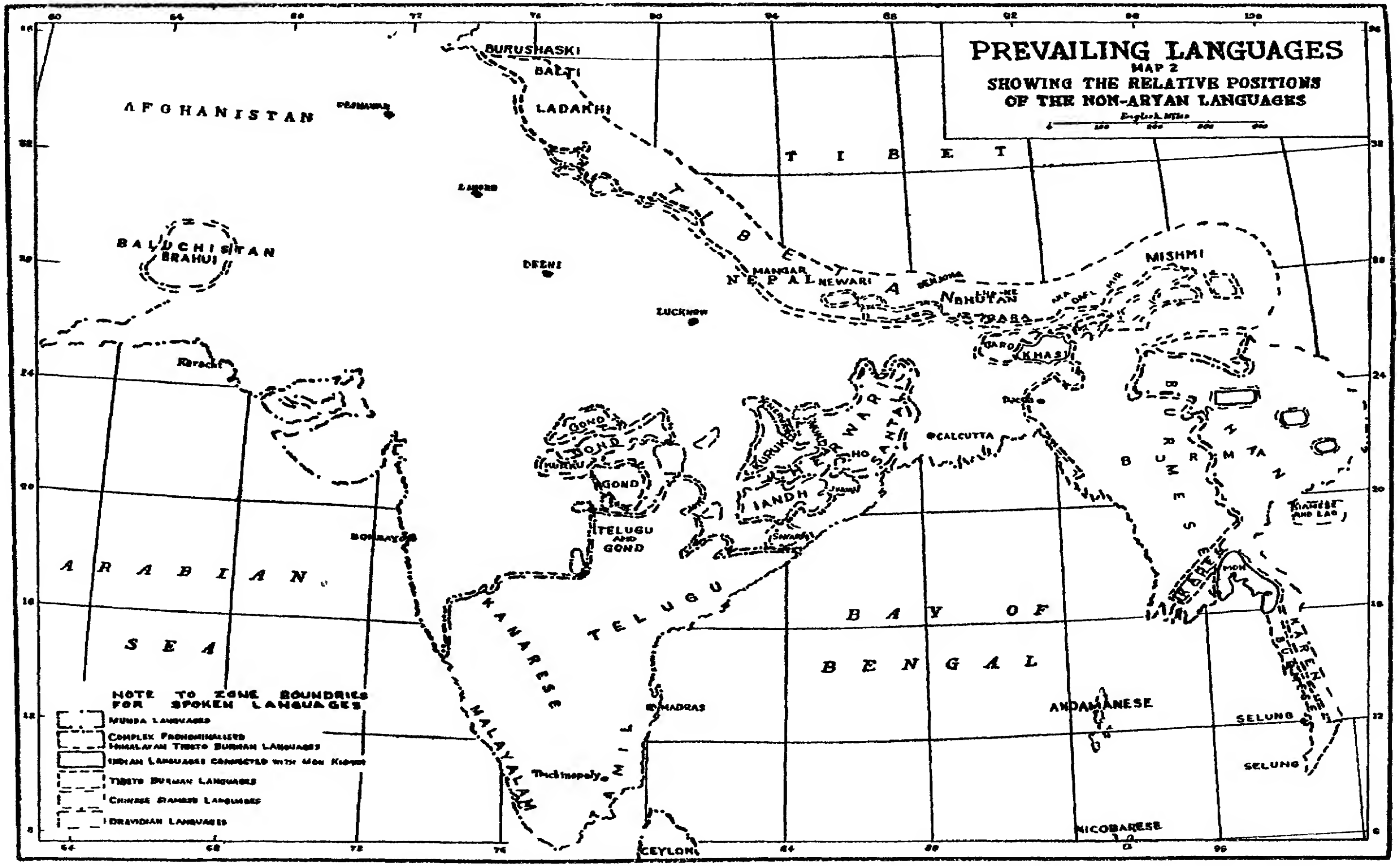
With the best goodwill in the world it is next to impossible to satisfy these demands fully as it will be noticed that as many as six at least of these languages, namely, Sindhi, Konkani, Canarese, Malayalam, Assamese and Oriya prevail in areas which are situated at considerable distances from the stations and the importation of talent from such distances would entail very heavy expenditure. Also their inclusion in the programmes would naturally be at the expense of the more immediately prevailing languages and would cause great discontent.

142. Even so, the list remains discouragingly large. Some stations are of course more fortunate than others. In Lucknow, for example, the demand does not differ from the supply. From Peshawar and Lahore the listeners demand Hindustani which though not spoken in the neighbouring country is nevertheless widely known and used. Three languages are demanded from Delhi, but the demand for Bengali and Tamil is only occasional and comes mostly from the comparatively small number of Bengalis and Madrasis domiciled in the Northern parts. Delhi can ignore their demands, partly because their number is small and also because such listeners should consider themselves amply provided for by the short-wave stations at Calcutta and Madras. Thus Delhi need confine itself only to Hindustani and since this is also the language spoken in the area in which the station is situated, no serious difficulty in securing suitable programme material is likely to arise. This, however, would not be true in the case of Calcutta which could not easily draw upon Oriya and Assamese speaking talent without considerable expense. Also since most of its listeners are concentrated in Bengal and speak Bengali, Assamese and Oriya would be looked upon by the majority as unwelcome intrusions.

143. Bombay illustrates another type of difficulty and provides a real example of the problems which arise out of the *multiplicity* of languages. Here the difficulty is not one of availability of talent, for Gujerati, Marathi and Konkani areas are within easy reach of it and there is no dearth in and around Bombay of people who can be employed for English and Hindustani items. The problem is one of accommodating at least four languages in 9 to 10 hours of daily transmission and under each of the various programme categories : namely, talks, drama, music, school broadcasts, feature programmes, etc., etc. Nor is it a satisfactory solution to distribute these languages amongst the two transmitters—short-wave and mediumwave—with which Bombay is equipped, for these languages are demanded by listeners both far and near and therefore from both the transmitters.

144. Madras is a problem by itself. Situated, as it is, on the frontier between Telugu speaking and Tamil speaking areas, it can—everything else being the same—draw upon either with equal facility. But every-


PREVAILING LANGUAGES
MAP 1
SHOWING THE LOCALITIES IN WHICH THE ARYAN LANGUAGES OF INDIA ARE SPOKEN
English Miles
AFGHANISTAN
PASHTO
GHALCHA
KAFIR LANGUAGE
KOHISTANI
SHINA
KASHMIRI
PESHAWAR
Rawalpindi
LAHNDA
BALOCH
BALUCHISTAN
QUETTA
SINDHI
Sind
Karachi
PANJABI
LAHORE
Multan
WESTERN PAHARI
Simla
CENTRAL PAHARI
EASTERN PAHARI
NEPAL
HINDUSTANI
DELHI
WESTERN HINDI
RAJASTHANI
Bhopal
BUNDELI
EASTERN HINDI
LUCKNOW
BIHARI
Bihar
MAITHILI
BHUTAN
ASSAMESE
BENGAL
DACCA
CALCUTTA
Chota Nagpur
ORIYA
Orissa
Cuttack
GUJARATI
Kathiawar
KHANDESHI
Berar
MARATHI
BOMBAY
KONKANI
HYDERABAD
MADRAS
MYSORE
Trichinopoly
Trivandrum
CEYLON
TIBET
BURMA
RANGOON
Andaman Islands
ARABIAN SEA
BAY OF BENGAL
NOTE TO ZONE BOUNDRIES FOR SPOKEN LANGUAGES
ERANIAN LANGUAGES
DARDIC OR PISACHA LANGUAGES
MIDLAND INDO ARYAN LANGUAGES
OUTER INDO-ARYAN LANGUAGES
INTERMEDIATE INDO-ARYAN LANGUAGES


PREVAILING LANGUAGES
MAP 2
SHOWING THE RELATIVE POSITIONS
OF THE NON-ARYAN LANGUAGES
English Miles
TIBET
AFGHANISTAN
BURUSHASKI
BALTI
LADAKHI
BALUCHISTAN
BRAHUI
NEPAL
MANGAR
NEWARI
BHUTAN
MISHMI
GARO
KHASI
BURMESE
GOND
KURKU
TELUGU AND GOND
IANDH
HO
TELUGU
KANARESE
TAMIL
MALAYALAM
ARABIAN SEA
BAY OF BENGAL
ANDAMANESE
NICOBARESE
SELUNG
CEYLON
MON
CALCUTTA
MADRAS
LUCKNOW
DELHI
BOMBAY
Karachi
Trichinopoly
NOTE TO ZONE BOUNDRIES FOR SPOKEN LANGUAGES
MUNDA LANGUAGES
COMPLEX PRONOMINALISED HIMALAYAN TIBETO BURMAN LANGUAGES
INDIAN LANGUAGES CONNECTED WITH MON KHMER
TIBETO BURMAN LANGUAGES
CHINESE SIAMESE LANGUAGES
DRAVIDIAN LANGUAGES

thing else in this case is unfortunately not the same. There are more listeners in the Tamil area than in the Telugu, Telugu has a stronger musical tradition and Tamil is richer in spoken word items. English again is fairly widely understood and at least serves to evade the Tamil-Telugu controversy.

145 Details of the languages used at the various stations are given below :

Principal languages used in A. I. R. broadcasts.

Songs.	Talks.	Plays.	News.	Rural.	School Broadcasts.
		1. DELHI.			
English. Hindustani.	English. Hindustani.	Hindustani.	Hindustani. English.	Hindustani.	Hindustani.
		2. BOMBAY.			
English. Hindustani. Gujerati. Marathi.	English. Hindustani. Gujerati. Marathi.	English. Hindustani. Gujerati. Marathi.	English. Hindustani.	Marathi.	English (except those of Marathi and Gujerati literature).
		3. CALCUTTA.			
English. Bengali. Hindustani.	English. Bengali. Hindustani.	English. Bengali. Hindustani.	English. Bengali.	Bengali.	Bengali.
		4. MADRAS.			
English. Tamil. Telugu.	English Tamil. Telugu.	English. Tamil. Telugu. Canarese. Malayalam.	English.	Tamil. Telugu.	Tamil. Telugu.
		5. LAHORE.			
English. Hindustani. Punjabi.	English. Hindustani.	English. Punjabi. Hindustani.	English Hindustani.	Hindustani. Punjabi.	..
		6. LUCKNOW.			
Hindustani.	English Hindustani.	Hindustani.	English. Hindustani.	..	..
		7. PESHAWAR.			
Hindustani. Pushto.	English. Hindustani. Pushto.	Hindustani	English. Hindustani.	Pushto.	..

146. Progressive public opinion on the question of languages seems generally to be in favour of a simplification of such problems by reducing linguistic diversities and helping towards the evolution of a common language. Out of sheer practical considerations, if no other, such an attitude is welcome to broadcasting. The language most useful from this point of view at this stage is undoubtedly English. Whatever the future of English in this country may be, the fact that at present it is used and understood in every part of India is a most favourable circumstance which All India Radio has not failed to make use of In view of the fact that Europeans form a by no means negligible proportion of our listeners it would, in any case, be inadvisable to abandon it A considerable section, however, of our Indian listeners is also accustomed to it and indeed uses it for most public purposes. The language next most widely employed by All India Radio is Hindustani—a term which has been tentatively adopted by All India Radio for the language spoken or at least understood in the greater part of Aryan speaking India

147 The term Hindustani is meant to cover both "Urdu" and "Hindi", for in doing so it saves All India Radio from many practical difficulties, although, no doubt, it does not make it entirely immune from criticism. "Urdu" and "Hindi" are, in point of grammar and syntax, practically identical and there is a considerable fund of vocabulary common to both. Three factors, however, contribute to separatism. Firstly, Hindi is generally written in the Devanagri script and Urdu in the Persi-Arabic script. Secondly, owing to various historical and sociological reasons Hindi has come to be associated with the Hindus and Urdu with the Muslims. Thirdly, Urdu writers tend to draw upon Arabic and Persian for expanding their vocabulary and Hindi writers upon Sanskrit Thus it is possible to have at one extreme, a piece of writing abounding in Persian and Arabic words, written by a Muslim and in Persi-Arabic characters; and at the other, a piece of writing abounding in Sanskrit words written by a Hindu and in the Devanagri script—and the gulf between them may be so wide that hardly any individual reader will understand both with equal facility, and indeed there will be many who will not understand either. These, however, are extreme cases. Between them lies a variety of shades. He will be a bold man indeed who could label each shade finally and decisively as either "Hindi" or "Urdu". To do so in broadcasting would be even more difficult, for the spoken word is independent of script which is an important mark of differentiation between Urdu and Hindi All India Radio has, therefore, no choice but to designate both these languages (if indeed they are two languages) as Hindustani and to leave individual listeners to decide for themselves whether a given Hindustani item is "Urdu" or "Hindi".

148. The spoken word is used in three ways: for announcements, for news and in "contributed" items such as talks, plays, etc. Announcements mostly consist of a number of stock phrases and sentences which gradually become standardized. The announcements used by All India Radio are couched in simple language and except in the case of certain forms of greetings have aroused little criticism. Hindustani news bulletins, however, have formed the subject of unending controversy. It must be remembered that a very large number of topics, which world news deals with, constantly refer to ideas, institutions and movements which have left most of the Indian languages lagging behind. To give a daily

account of such topics in racy Hindustani is, therefore, by no means an easy task. Where the aim is to achieve maximum intelligibility over an area which extends as far as the Bombay Presidency in one direction and Peshawar in the other, a constant search for the most widely spoken word and the most living phrase is essential. This cannot be successful without a very practical and liberal outlook in the choice of vocabulary. Some deviations from purist standards are, therefore, unavoidable as are also shocks, here and there, to the linguistic habits of individual listeners. It is not, therefore, surprising that the Hindustani news bulletins of All India Radio should be criticised, sometimes for their Hindi bias, at others for their Persian bias, frequently for both at the same time, and now and then for their polyglot character. There is, however, a feeling in the country that All India Radio should assist in the evolution and expansion of a common language for India and it is in pursuance of this feeling, no less than for more practical considerations, that All India Radio is endeavouring to widen the scope of Hindustani.

149. In the case of "contributed" items, authors and talkers are constantly reminded that the simpler their language, the wider the range of their listeners. But it is obvious that there is a limit beyond which the insistence of All India Radio staff cannot go. Authors (and specially good authors) resent being prescribed to, and in any case find it difficult to change the style of writing to which they are accustomed.

150. Linguistic problems, however, do not arise merely out of the multiplicity of languages. They are in no small measure due to the present day Indian *outlook* on language. This outlook is in a fluid state and incontrovertible guidance is lacking. A representative group of our listeners would, perhaps, consist of—

A The European. English is all that he cares for

B The Westernised Indian. To all intents and purposes his mother tongue is English.

C The Educated Indian. Conducts most of his daily business in English and if invited to give a talk would choose English as his medium. But sincerely hopes that Indian languages will flourish and gain in status.

D The Middle Class Indian Can understand, read and write English—has to—but is not capable of *enjoying* an English programme.

E The Patriot. Would fain replace English by an Indian language but is terribly perplexed as he has not decided which Indian language it shall be.

F The Nationalist. Is striving to establish a *lingua franca* for India which he supports in addition to his own mother tongue.

G The Provincial. Does not mind a *lingua franca* but in the meantime must fight for his own dialect.

H The Separatist. Is extremely jealous of his own linguistic culture and will brook no inroads upon it in the name of national unity or inter-provincial intercourse.

I The Democrat. Does not think a spoken word item worth having unless every word of it is intelligible even to the most illiterate listener.

J The Litterateur. Does not think a spoken word item is worth giving or listening if it has to be ' vulgarised " and falls short of the best literary standards

K The Villager. Is generally familiar with the " court language " of his province through the law courts and government officials, but is at home only in his own dialect which very often is not a written language.

And of course, there are mixed types which partake of the characteristics of more than one category.

151. Amongst such diversity of opinion, All India Radio cannot hope to win universal approval in its linguistic efforts. All that it can hope to do is to proceed cautiously, though not illiberally, and to attempt to combine minimum diversity with maximum intelligibility.

CHAPTER IV.

PUBLIC RELATIONS.

CHAPTER IV.

PUBLIC RELATIONS.

152. Administrative machinery set up specially for the purpose of establishing and maintaining contacts with the public is an important part of any broadcasting organization. Owing to the limited funds at its disposal All India Radio has not yet been in a position to run a Public Relations Department with any degree of adequacy. The need, however, for such contacts is a constant and a pressing one and in spite of the lack of staff and funds for this purpose, All India Radio has not entirely ignored this aspect of its activities An effort to maintain contact with public views and preferences is at present made by issuing questionnaires, by the appointment of Advisory Committees, by Listeners' Research, by the publication of radio journals and by general publicity. A brief account of these activities is given below.

SECTION 1.

Questionnaires.

(i) Delhi.

153 In December 1936 the following questionnaire was issued to 1,500 licence-holders residing within 80 miles of Delhi :

1 Are the programme timings satisfactory ?
2. Do you prefer classical or light music ?
3. Do you prefer—
   Khyal ?
   Thumri ?
   Ghazal ?
   Dadra ?
   Qawwali ?
4. Which are your favourite artists ?
5. Which artists do you dislike ?
6. Would you like more—
   Talks ?
   Music ?
   Drama ?
   News ?
7. How many hours a day do you listen ?
8. What set do you use ?
9. Do you listen to European programmes ?
10. Have you any suggestions for the improvement of programmes ?

In forwarding the questionnaire the Controller said : "The Delhi Station has now been transmitting daily programmes for nearly one year, and I am anxious to find out how far these programmes are meeting with the approval of our listeners, and whether there are any modifications or improvements which are desired by the majority of those who possess

licences. If you would be kind enough to complete and return the enclosed questionnaire, adding any comments you may wish to make, I shall be most grateful.''

154. Only 650 replies were received but the fact that nearly 50 per cent. of the addressees had taken the trouble to reply was in itself encouraging. The facts that seemed to emerge most clearly from the replies may be summarised as follows :

1. The percentage of listeners who expressed an appreciation of classical music was about 33. Most of the remainder expressed a very strong dislike of it.
2. Appreciation of the timings of programmes was almost unanimous.
3. In Indian music the *ghazal* was by far the most popular and the *qawwali* the next in order. The *khyal* was the least popular.
4. There was a very general desire for more and better drama.
5. More than 50 per cent. of the Indian listeners listened to and appreciated European music.
6. The number of Europeans answering the questionnaire was about 100.

(*ii*) *Bombay.*

155. In May 1938, a more exhaustive questionnaire was issued to 17,000 listeners in the Bombay Presidency. A copy of the questionnaire is reproduced below :

1. Would you be sorry if the Bombay Station stopped its—

   morning transmissions ?

   midday transmissions ?

   European music programmes ?

   talks in English ?

   talks in Marathi ?

2. What is the maximum time which should be allotted to any one artist—

   (*a*) at a stretch ?

   (*b*) total for the day ?

3 Of the languages which you speak which one would you describe as your mother tongue ?

4. Do you generally listen to classical Indian music light Indian music or European music ?

5. How many talks (15 minutes each) a day would you like, and in what language ?

6. Between 6 and 11 P.M. (excluding talks, news and village hour) three hours are allotted to music How much of these three hours would you allot—

   (*a*) to Indian music ?

   (*b*) to European music ?

7. If you listen to dramas, how many plays per week do you think we should be broadcasting ?

   How long should each play last ?

   In what language should it be ?

8. What is—
   (a) your nationality ?
   (b) your religion ?
   (c) your profession ?
9. The Bombay station can now be heard over the greater part of India. If this station were to broadcast in one language only, which of the following would you prefer that language to be :
   Hindustani (Hindi or Urdu) ?
   English ?
   Marathi ?
   Gujerati ?
   Canarese ?
10. In what language would you like the Calcutta, Delhi, and Madras shortwave stations to broadcast to you ?
11. Are you interested in commercial prices ?
    If so, at what time of the day and in what language would you prefer them ?
12. How satisfactory is your reception of the Bombay Short Wave Station during—
    Transmission I ?
    Transmission II ?
    Transmission III ?
13. How satisfactory is your reception of the Delhi Short Wave Station during—
    Transmission I ?
    Transmission II ?
    Transmission III ?
14. Have you any suggestions for the improvement of Programmes ?

About 7,000 replies were received which, it was felt, could be taken as representative of the tastes of listeners in the Presidency as a whole.

156. The replies to the first question confirmed the fact, which is common to all broadcasting, that there are enthusiastic listeners for any time of the day. About 4,500 listeners were in favour of morning transmissions, whilst 1,500 were against them. 4,500 were in favour of midday transmissions and 1,500 against them. It seemed therefore that All India Radio could not give up these transmissions though, for the sake of economy, it would very much have liked to do so. As regards European music, the replies were almost equally divided, 3,000 listeners being in favour of it while 2,700 would have abolished it. About 1,300 listeners remained neutral and did not answer the question. For English talks there was a majority, 3,300 being in favour of them and 2,200 against. Again a certain number did not reply at all. The answers to the questions whether Marathi talks should be discontinued were curious and surprising. Replies to a later question (No. 3) showed that among 7,000 listeners less than 1,500 could describe Marathi as their mother tongue but in spite of this there were 1,800 listeners who voted for Marathi talks. Against this was the extraordinary figure of 3,700 listeners who voted

against Marathi talks and wished them to be abolished. The conclusion in this case seemed to be that the Bombay Station, when putting out a Marathi talk, was pleasing about one quarter of its listeners but actually irrigating about one-half.

157. Question No. 2 produced the harrying diversities of opinion which are familiar to all broadcasting organizations. The question, how long one particular artist should sing, is a constant point of controversy In this case 1,200 people voted for less than 15 minutes ; 1,500 for less than 30 minutes ; 1,200 for less than one hour and 1,100 for more than an hour. One conclusion which could be drawn from these results was that over 4,000 listeners were in favour of restricting artists to less than one hour ; and of these 2,800 or nearly three-quarters would restrict them to less than 30 minutes, while only 1,100 wished for more than one hour. Opinions, therefore, seemed to tend towards a period of about 30 to 45 minutes As regards the total which should be allotted to any one artist on any one day only 850 were in favour of less than 30 minutes, while 3,500 were in favour of one hour or more. This seemed to show that there was no objection to more than one performance by the same artist on the same day

158. Replies to Question No 3 were as follows :

Gujerati	2,496
Marathi	1,480
Hindustani	1,220
English	860
Canarese	70
Konkani	39

Compared with these figures, there were some curious divergencies in the replies to later questions to which allusion will be made later.

159. The 4th question is of considerable importance to broadcasting. Although the question was put in the form " Do you generally listen to classical Indian music, light Indian music or European music " many listeners replied that they listened to all three, or to two of these with the result that the replies in this case totalled nearly 11,000. Of these 4,800 listened to light Indian music ; 3,900 to classical Indian music, and 2,100 to European music. This gives a proportion of 100 to 82 to 44, or in other words, two hours of light Indian music to 98 minutes of classical Indian music to 53 minutes of European music.

160. Question No. 5 asked how many talks a day listeners would like and in what language. Here again there was a wide divergence of opinion. As regards the number of talks per day the majority of opinion was equally divided between one and two : 2,300 listeners voting for each, while only 700 voted for three. It has, however, to be remembered that these listeners were voting for talks *in their own language* and the numbers are not, therefore, a very reliable guide.

161. Coming to the question of language, a most important one in the Bombay Presidency, we may deal with the answers to this question

and also with the answers to questions 8 and 9. As far as talks are concerned the voting was as follows :

Hindustani	2,567
English	2,532
Gujerati	1,742
Marathi	1,559
Canarese	52
Konkani	12

It will be observed that about 1,400 listeners voted for two languages. Even so, the result was a surprising one when taken in conjunction with the replies to the question as to what the listener's mother tongue was. More than 5,000 listeners or nearly 60 per cent. appeared to want talks either in English or in Hindustani. The exact proportion of the demand for Hindustani, English, Gujerati, Marathi was 100 to 99 to 67 to 60 and if the Bombay Station were to work exactly on this basis there would be, out of 65 talks per month, 20 in English, 20 in Hindustani, 13 in Gujerati and 12 in Marathi. This is not a very happy result, because the use of four languages must be a severe strain on the staff of any broadcasting station and must also detract from general programme values. If we pursue the question of language a little further in the replies to questions 9 and 10 we find an even more surprising result. The question asked (No. 10) was which language they would like the Calcutta, Delhi and Madras Short Wave Stations to broadcast. The replies were as follows :

Delhi—	
Hindustani	3,848
English	1,736
Calcutta—	
Hindustani	3,549
English	1,754
Bengali	399
Madras—	
Hindustani	3,525
English	1,781
Tamil	394
Telugu	219

162. In question No. 6 listeners were asked how much of the three hours allotted to music in evening programmes they would give to Indian or European music. Some listeners refrained from answering this question but as regards Indian music 4,674 were in favour of 2 hours or less whilst 969 would have taken the whole three. With regard to European music 4,198 voted for one and half hours or less as against 690 who would have taken two or three. The result seems to justify present programme policy.

163. Question No. 7 which related to drama and asked how long plays should last and in what language they should be, elicited so many divergent opinions that it was difficult to draw reliable conclusions from them. As regards the language of plays Marathi earned a place which it did not earn elsewhere, the results being :—

Hindustani	2,952
Marathi	2,573
Gujerati	2.398
English	1,341

It will be noticed that here again some 2,000 listeners voted for two languages. The duration of plays was clearly a matter upon which listeners disagreed and many did not answer. 900 listeners were in favour of 15 minute plays ; 1,203 in favour of 30 minute plays ; 800 in favour of 45 minute plays and 1,500 in favour of plays lasting one hour.

SECTION 2.

Advisory Committees.

164. Soon after the inauguration of the Delhi Station, the Controller felt that it would be desirable to ask a few prominent members of the public to advise him on matters regarding the taste of listeners and the talent available. At his request, about a dozen prominent citizens of Delhi were kind enough to form an informal Advisory Committee which met by invitation. On the 21st August 1936, this Committee consisting of the following members was formally recognised by the Government in a press note issued by the Department of Industries and Labour on that date :—

President—The Controller of Broadcasting.

Secretary—Director, Delhi Station (*ex-officio*).

Members—

(1) Prof. B. N. Ganguli.

(2) Dr. S. K. Sen.

(3) Pandit Haksar.

(4) Mr. Shiv Raj Bahadur.

(5) Mr. Ghulam Mohammed.

(6) Mrs. Asaf Ali.

(7) Mrs. K. Krishna Rao.

(8) Prof. Mirza Mohammed Said.

(9) Hon'ble Raja Charanjit Singh.

(10) Sir M. Yamin Khan.

(11) The Educational Commissioner with the Government of India (*ex-officio*).

(12) Lala Shri Ram.

(13) Rai Bahadur Ram Kishore.

(14) Dr. Zakir Husain.

165. The Committee, known as the Delhi Station Advisory Council, was to meet at suitable intervals to be determined by the Controller. and to advise on matters referred to it. No period of membership was fixed and the terms of reference were—

(*a*) to make recommendations on general programme policy,

(*b*) to submit reports on special programme items upon which the authorities particularly desired guidance,

and (*c*) to comment upon schedules of future programmes and to suggest such modifications and improvements as were considered desirable.

166. The first meeting of the Council was held on the 30th October 1936 in which sub-committees were elected to deal with the following subjects in greater detail :—

(*a*) Education.

(*b*) Language.

(*c*) Music

(*d*) Talks and Dramas.

(*e*) Rural Programmes

167. Subsequent meetings of the Council were held on the 30th January 1937, 3rd May 1937, 16th August 1937 and the 10th January 1938.

168. The main recommendations made by the Council and an account of the action taken upon them is given below :

(*i*) The Council recommended that the programme grant of the Delhi Station be raised from Rs. 300 to Rs. 500 per day. This recommendation was forwarded to the Government of India and although the increase recommended could not be sanctioned, the recommendation helped to emphasise the desirability of greater programme funds.

(*ii*) In view of the dearth of plays, suitable for broadcasting the Council recommended that a prize of Rs. 500 should be offered for a good radio play in an Indian language. This recommendation was given full consideration and the main principle was accepted, but the value of the prize was modified to Rs. 250 per annum for five years. Plays were invited for the first competition in July 1937 and were submitted to the Talks and Drama Sub-Committee for the final award. On the recommendation of the sub-committee it was decided that since no competitor had achieved a satisfactory standard, the prize should not be awarded.

(*iii*) The Council recommended the appointment of a Music Director on Rs. 500 per mensem with two assistants on Rs 200 per mensem. The suggestions and cognate questions concerning the appointment of Directors of Indian and European Music were examined at length by the Government of India, but have had to be dropped for the time being on financial and other grounds.

(*iv*) The Council urged upon the Controller of Broadcasting the desirability of arranging programmes for schools in consultation with the local authorities. This has been done and school programmes are being broadcast from Delhi from October 1938

(*v*) At the recommendation of the Advisory Council a questionnaire was issued to 1,500 licence-holders within the Delhi area. This has been dealt with earlier in this chapter

169. The constitution of Advisory Committees for other stations is under the consideration of the Government of India.*

170. The terms of reference of the Committees are given below :

" (i) The purpose of these Committees will be to keep the Controller in touch with local public opinion in the matter of programme construction and to advise him on such matters as may be referred to them for advice

(ii) The Committees will be purely advisory bodies and will not have any administrative functions.

(iii) Two members of each committee will retire every two years and make room for two other persons. The decision as to who should retire will rest with Government.

(iv) Service on the Committees will be entirely honorary. Meetings will be convened by the Controller at his discretion, but not less than twice a year."

---

*Although not falling within the period under review, it may be mentioned that the personnel of Advisory Committees for Madras, Bombay and Calcutta has since been announced, as also the personnel of a reconstituted Advisory Committee for Delhi. These are given below. In each case, the Controller of Broadcasting is the *ex-officio* President, and the Station Director concerned, the *ex-officio* Secretary of the Committee.

(a) *Madras.*

1. Mr S. Satyamurti, M.L.A. (Central), Madras.
2. Sri R. Krishnamurthi, Editor, *Ananda Vikatan*, Madras.
3. Sri K. Swaminathan, M.A., Prof. of English, Presidency College, Madras.
4. Srimathi R. Lakshmipathi, M.L.A. (Provincial), Deputy Speaker, Legislative Assembly, Madras.
5. Janab Bashir Ahmed Sayid Sahib Bahadur, M.L.A. (Provincial).

(b) *Bombay.*

1. Sir Rahimtoolah Chinoy.
2. Mr. V. N. Chandavarkar.
3. Lt. Col. Sir Richard Temple.
4. Rani Laxmi Bai Rajwade of Gwalior.
5. Mr. B. S. Sukthankar.

(c) *Calcutta.*

1. Mr N. Barwell, Bar.-at-Law.
2. The Hon'ble Khan Bahadur Azizul Haq.
3. Mr. Birendra Kishore Roy Choudhuri (of Gouripur).
4. Mrs. J. De (Wife of Mr. J. De, I.C.S.).
5. Mr. K. Nooruddin, M.L.A. (Provincial).

(d) *Delhi.*

1. Educational Commissioner with the Government of India, Simla|New Delhi.
2. Mirza Mohd. Said, I.E.S. (Retired), Delhi.
3. Mr. S. N. Bharati, Editor, *The Hindustan Times*, New Delhi.
4. Dr. Alice Pennell, 4, Underhill Lane, Delhi.
5. Professor M. Mujeeb, Jamia Millia, Delhi.

SECTION 3

Listeners' Research.

171. Station Directors are instructed to answer all enquiries addressed to them however trivial, impertinent or irrelevant they may appear to be, to do so as promptly and courteously as possible, and to study and analyse whatever evidence of listeners' reaction to programmes and programme policy comes to their notice through the press, through listeners' correspondence or through personal interviews with the representatives of the public. Since October 1938, detailed statistics of the appreciations and criticisms received are maintained at all the stations under the following heads :

General Programmes.
Indian Music (Vocal).
Indian Music (Instrumental).
European Music (Vocal).
European Music (Instrumental).
Talks (Indian Languages).
Talks (English).
Children's Programmes.
Women's Programmes.
Indian Drama.
English Drama.
News.
Rural Programmes.
Religious Items.
Special Programmes.
New Programme Arrangements.

172. A weekly analysis of the correspondence received is made and weekly statements along these lines are prepared and forwarded along with Station Directors' comments to Headquarters where they are carefully studied in order to keep in touch with the listeners' views and wherever necessary to mould programme policy accordingly. This type of research provides a valuable guide to public opinion and one that is more reliable than statements, criticisms or correspondence appearing in the press which are often the expression of individual opinions but which tend to be invested with exaggerated importance on account of the prominence and publicity which the printed page bestows on them. Representative letters are periodically read and discussed before the microphone and periodic talks are given by the Station Directors and by the Controller in explanation or elucidation of programme policy and future plans. Detailed statistics relating to programme composition are maintained at all stations and are frequently made use of to study questions of programme balance and to answer questions and statements which are based on prejudices and vague impressions formed only too obviously in haste and in ignorance of the real facts.

SECTION 4.

Radio Journals.

173. Radio journals provide a useful link between broadcasting an its listeners. A fuller account of the five journals published by All Indi Radio appears in Chapter VIII. Here it will be sufficient to note tha according to the latest figures relating to the period under review the tota number of listeners reached through these is 33,100 or about 47 per cent of the total number of listeners and is distributed among the variou journals as follows :

Radio Journal.	*Language.*	*Subscribers.*
Indian Listener	English	21,250
Awaz	Urdu	5,000
Sarang	Hindi	2,500
Betar Jagat	Bengali	3,100
Vanoli	Tamil	1,250

Explanatory notes under individual items of the programmes that appear in these journals as well as editorial comments on the activities of All India Radio are designed to assist the readers to an intelligent appreciation of the programmes and to a better understanding of the aims and objects of All India Radio. Articles on technical subjects are also published occasionally and whenever space is available, readers' enquiries on technical questions are published and answered in the correspondence columns. A number of texts of broadcast talks have also been reproduced in these journals.

174. It must, however, be noted with regret that financial considerations and the consequent limitations of space do not permit the fullest use that could be made of these journals for a free exchange of views between broadcasting authorities and the listeners and for an adequate treatment of the many major and minor broadcasting problems that agitate the public mind.

SECTION 5.

General.

175. In view, however, of the ever widening front that broadcasting presents to the public, all these means of maintaining public relations, though not without their uses, are still extremely limited in their scope.

176. It must be remembered that in India a new activity like broadcasting, full enough as it is of doubts and difficulties for those who are placed in charge of it, is even more puzzling to the 70,000 listeners. If broadcasting is to win and maintain the goodwill of its listeners, as indeed it must, it should be in a position to allay their legitimate doubts whenever expression is given to them, and to answer efficiently all the multifarious enquiries addressed directly or indirectly to it by the evergrowing clientele. Some idea of the extent of work involved on this account only, will be

gathered from the fact that during the period October 1938 to March 1939, for which statistics have been maintained, some 20,000 letters were addressed to the various Station Directors by critical or appreciative listeners in India and abroad. This does not include the enquiries addressed to Headquarters or the other subordinate departments like the News Department, the Installation Department and the Research Department by listeners, prospective broadcasters of all types, producers, authors, artists, seekers after employment, students, Universities, radio dealers, radio manufacturers, provincial governments, local bodies, newspapers, gramophone companies, collecting bodies, news agencies, Trade Commissioners and other broadcasting organizations in India and abroad. In India itself, interest in broadcasting and a desire to study and understand its manifold problems is increasing amongst all sections of the public. As many as 33 questions relating to broadcasting were asked in 1936, 27 in 1937 and 31 in 1938 in the Central Legislatures and a full dress debate on Broadcasting was held during 1938 in the Central Legislative Assembly in which 14 members took part. An increasing number of journals is now adopting a radio page or a radio supplement as a regular feature but the information offered to the public in these pages is not always accurate or helpful to the correct understanding of the development of broadcasting in this country. More and more space is also being taken up every day in the news, editorial and correspondence columns of the newspaper press. The questions raised deal with almost all the activities and aspects of broadcasting including development, the siting of stations, the power and the range of the transmitters, the wavelengths, the purchase of stores, the recruitment and appointment of staff, the composition and timing of programmes, the quality of programmes, the length of transmission, the organization of relays, the reception of signals, electrical interference, language questions, individual artists and speakers and the thousand and one minor problems that prompt listeners of all classes to write to the broadcasting authorities or to their local papers or are made the basis of interpellations in tones of anger, appreciation, interrogation or confusion. All India Radio has taken upon itself, as far as lies within its power, to answer every single letter received as courteously and as helpfully as possible. Statements, criticisms and enquiries appear in the press which call for authoritative explanations from the All India Radio directorate in order to remove misunderstandings, and doubts. There are also occasions, such as the opening of a new station, an alteration in wavelength, an important short notice relay, an anti-piracy drive, a programme feature of India-wide interest, etc., etc., when useful information with regard to the present or future activities of All India Radio must be offered to the public without waiting for enquiries. Add to these the constant stream of irate, sceptical, well meaning or merely inquisitive visitors that keeps pouring into various stations and the Headquarters all through the year who must be seen, cajoled, persuaded or educated by a staff whose chief function is not to answer enquiries but to organise programmes, and it will be seen under what great strain All India Radio is trying to maintain adequate relations with its listeners.

CHAPTER V.

ENGINEERING AND TECHNICAL.

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ENGINEERING AND TECHNICAL.

SECTION 1.

Introductory.

177. At the time of the formation of the Indian State Broadcasting Service, the engineering and technical control of broadcasting was taken over by the Posts and Telegraphs Department. Shortly after the appointment of the Controller of Broadcasting and following the recommendations of the Kirke Report, these activities were re-transferred to All India Radio in order to avoid the admitted difficulties of divided control between administration and programmes and engineering.

178. The activities of the Engineering Department are concerned mainly with the maintenance and operation of existing broadcasting centres, the planning and installation of new broadcasting centres, and development and research work of a technical nature.

179. The establishment of new stations was taken in hand as soon as the development programme under the Rs. 40-lakh scheme had finally been decided upon in December 1936, and only four weeks later orders for ten transmitting equipments were placed through the Indian Stores Department. A heavy burden was immediately thrown on the Engineering Department in carrying out the necessary preparations involved in the establishment of so many broadcasting centres which in each case include the choice of a suitable site for the transmitting station, the acquisition of land, the construction of a transmitting station building, the arrangements for power supply facilities, the arrangements for telephone connections, the installation of transmitting equipment, the modification of buildings to be used for studios, the acoustic treatment of studios and the installation of studio technical equipment.

180. An item of particular importance and difficulty was the accurate timing of the completion of transmitting station buildings to coincide with the arrival of the transmitting equipment. At one stage in the development programme no less than five transmitting station buildings were under construction simultaneously by the Public Works Departments and transmitting equipment was arriving every week at four Indian ports.

181. The first two new stations under the development programme were opened simultaneously on December 16, 1937—eleven months after orders had been placed—a 5 K.W. mediumwave station at Lahore, with five acoustically treated studios and a 10 K.W. shortwave station at Delhi. During the following eight months eight further transmitting stations and four studio centres were opened.

182. The Installation Department established in January 1937 to handle the work involved in the establishment of the new broadcasting centres comprised one Installation Engineer, two Deputy Installation Engineers, three Assistant Engineers and three Technical Assistants and in addition the necessary clerical staff. The Installation Department is divided into four groups—the Headquarters Group, the group working on the installation of shortwave transmitters, the group working on the installation of

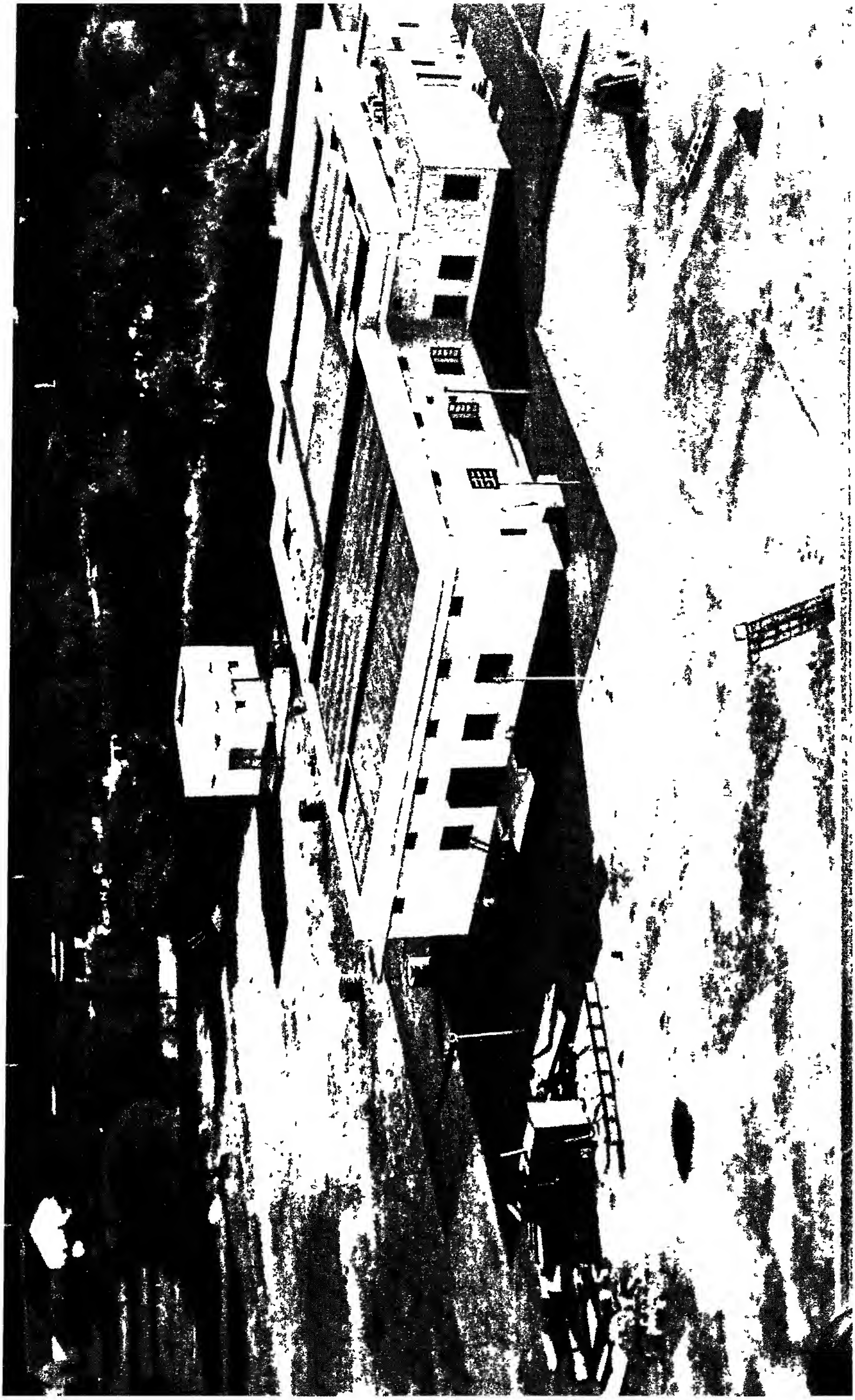
mediumwave transmitters and the group working on the modification and acoustic treatment of studies. Recently a group dealing with the establishment of Receiving Centres has been formed.

183. A new feature in the development of a broadcasting service over a large area has been introduced in India as part of the present development programme by the use of wavelengths in the intermediate frequency band around 60 and 90 metres for internal broadcasting. The reasons for the use of these wavelengths are discussed later in Section 3. A certain amount of difficulty was experienced at first owing to a number of sets being in existence which were not able to tune to these wavelengths. This difficulty was appreciated at the time the decision to use these wavelengths was taken, but it was not possible to justify prejudicing the future development of broadcasting in India by avoiding the use of these new wavelengths in order to avoid inconvenience to a small percentage of the number of owners of wireless receivers not covering the 60 and 90 metre wavelength bands at that time The shortwave transmitters at Delhi, Bombay, Madras and Calcutta are now in regular operation using the 60 metre band for night-time transmission, and the experience obtained so far amply justifies the use of these wavelengths.

184. A very considerable number of reports of reception of the All India Radio transmitters is received each week at the various stations. These reports originate both in India and from foreign countries. It is evident from these reports and measurements made by the Research Department of All India Radio that the shortwave transmitters provide a satisfactory second-grade service to the whole of India throughout the year. During most months of the year a good service is also provided to countries near India and during the winter months a great number of reception reports is received from Europe and America

185. A problem of great complexity and growing importance is the shortage of space in the shortwave bands for the operation of the very large number of broadcasting stations now in existence. India is fortunate in having reserved and put into use and thereby established a prior claim on four of the new frequencies in the 60 metre band Similar reservations have been made in the 90 metre band There is, however, not room for many more stations in these bands without danger of interference The same difficulties apply to the other wavelengths used by the Indian shortwave service. A daily watch is kept on all Indian transmitters to check the development of any interference and steps are taken to keep the wavelengths clear. However, the growth of new shortwave stations is so rapid that the future gives considerable cause for anxiety.

186 In any broadcasting system very great use is made of connections between various stations of the system so that programmes originating at one station may be radiated from the other stations. This is usually effected by special telephone wire circuits between one station and another. This, however, presents a particularly difficult problem in India owing to the immense distances separating the various stations. For economic reasons, the existing telephone circuits can only be overhead lines, which, over such long distances, are extremely difficult to keep free from disturbances. The technical equipment associated with these telephone lines is not intended for broadcasting purposes and cannot consequently be satisfactorily used. All India Radio have consequently developed the system



of wireless links between the various stations whereby each broadcasting station is provided with a receiving centre equipped with special directional aerials for picking up programmes from the desired stations. These receiving centres are used principally for picking up the shortwave transmissions of All India Radio and the B. B. C. Such transmissions are then relayed from the local transmitter. In the same way the news bulletins of the Central News Organization at Delhi will, as receiving centres are established, be received and relayed by all stations in the system. Further technical information on receiving centres is given in Section 8.

187. It may be mentioned that the receiving centres at Delhi and Bombay have now been successfully operated for some months on all-day relays, and that, since the conversion of the Peshawar Station into a relay centre, on the 1st March 1939, the Delhi shortwave programmes have been relayed daily through that station.

188. A Research Department was created in April 1937 and a Research Engineer and technical staff were appointed. The Research Department has had a great deal of important work to carry out during the development programme, and some of the results of this work are given in subsequent sections of this chapter. In addition to the work specifically mentioned, studies are now being made of the ionosphere by regular pulse transmissions ; measurements on the angle of down coming waves ; theoretical studies and measurements on different types of transmitting aerials for the shortwave service and studies of broadcast receivers and special cheap receivers.

SECTION 2.

Field Strength Measurements of the Mediumwave Stations and their Interpretation.

189. The service area (the area in which satisfactory reception can be obtained from a particular broadcasting station) is determined by the ratio of the strength of the signal to the strength of the disturbing noises. The strength of the signal itself is dependent upon many factors, such as the distance from the transmitting station, the power of the transmitting station, the conductivity of the soil around the transmitting station, etc. The disturbing noise is caused by atmospheric disturbances or electrical interference from machinery, fans, etc.

190. It is very evident that the manner in which the strength of the signal varies with distance and the magnitude of the disturbing noises are two very important factors to be considered when planning a broadcasting service for any locality. During the past year the Research Department of All India Radio has carried out a great number of measurements of field strengths on All India Radio stations. The measurements may be divided into two categories—measurements made on mediumwave stations and measurements made on shortwave stations. This report deals with the measurements on mediumwave stations only.

(i) Results of Field Strength Measurements.

Lahore.

191. The variation of field strength with distance around the transmitting station at Lahore is shown in fig. 1. This curve represents the

average result of measurements taken in a number of different directions from the transmitting station. From the slope of the curve it is possible to estimate the conductivity of the ground, which is found to have an average value of $1 \cdot 5 \times 10^{-13}$ e. m. u.

192. The near side of the city of Lahore is approximately six miles from the transmitting station and the far side ten miles. It will be seen from the attenuation curve that the field strength through the city will be of the order of 65 and 35 millivolts per metre. This value is higher than the actual measured value as the attenuation curve is taken over open country while the city of Lahore, due to the increased absorption due to buildings, etc., will receive a lower field strength than indicated in the curve. Field strength measurements made in various sections of the city show that the field strength varies between 30 and 59 millivolts per metre.

193. The distance from the transmitting station to Amritsar is approximately 20 miles. The maximum field strength to be expected in Amritsar is therefore 13 millivolts per metre. The actual measured value in various parts of the city of Amritsar varies between 7 and 8 millivolts per metre.

Lucknow.

194. Field strength curves for the Lucknow transmitting station are shown in fig. 2. The average conductivity of the ground is found to be $1 \cdot 75 \times 10^{-13}$. The town of Lucknow extends from 6 miles to 10 miles from the transmitting station and according to fig. 2 (for measurements over open country) will receive a field strength between 65 and 35 millivolts per metre. The actual measured values show a field strength variation from 28 to 58 millivolts per metre. Cawnpore is 30 miles from the transmitting station and the measured field strength in the city varies between $3 \cdot 5$ and $6 \cdot 5$ millivolts per metre.

195. The values of field strengths at Lahore and Lucknow have very closely approximated to the original calculations for field strength on the basis of which the transmitting station site for these two stations was chosen and its distance from the town.

Delhi.

196. Field strength measurements taken of the Delhi mediumwave station are shown in figures 3 and 4. Two curves are shown one taken along the Ambala Road and the second taken along the Agra Road. The value for the conductivity of the ground obtained from these curves is between $1 \cdot 5 \times 10^{-13}$ and 1×10^{-13}. It is possible that field strengths taken in other directions would show different values as it is known that the horizontal polar diagram of the transmitting aerial is not circular, as the vertical transmitting aerial is supported by two towers which modify the polar diagram. In the case of the Lahore and Lucknow Stations a single self-radiating mast is used which has an essentially circular polar radiation diagram.

(ii) Field Strength and Interference.

197. The above information as it stands does not permit an estimate to be made of the distance over which satisfactory reception of a station will be obtained as the extent of atmospheric disturbance and electrical disturbance has not yet been determined. The measurement of the magnitude

of atmospheric disturbances at various times of the year has been discussed in the section on the measurement of atmospheric disturbances. A number of observations have also been made in various cities on the magnitude of noise due to electrical apparatus. It is found that by far the most important source of electrical interference is due to electric fans in the direct current areas which extend over wide areas in most cities. The amount of this interference varies greatly with the seasons of the year as also does the extent of the interference due to atmospherics. This results in a wide variation in the effective service area of a broadcasting station throughout the year. The only satisfactory method of expressing the field strength required is to estimate the percentage of the time during the year that a field strength exceeding a certain value is required to give a satisfactory service. In figure 5 is shown a provisional curve showing the percentage of the time during the year that a field strength exceeding the values given is required to give a 20 DB signal to noise ratio with a 30 per cent. modulated carrier. For example, it will be found from figure 5 that for 50 per cent. of the year a field strength of 1·5 millivolts per metre is sufficient to give the grade of service determined by the above figures while to give a similar service for 95 per cent. of the year a field strength of 20 millivolts per metre is required.

(iii) Estimated Range of Stations.

198. From the information contained in the curves figure 1 to figure 4 on the variation of field strengths of the various stations with distance and the information contained in figure 5 showing the percentage of the time a field strength greater than the value shown is required, it is possible to draw a curve showing the percentage of the time during the year that the range of a broadcasting station will not be less than a certain distance with the grade of service specified. This information for the 5 K.W. stations at Lahore and Lucknow and the 20 K.W. station at Delhi is given in figure 6.

199. The number of observations which it has been possible to carry out during the past year is not sufficient to place full reliance on the values obtained. However, these figures represent a beginning in measurements of this type and the curve will be modified in time as more information becomes available. This information applies to northern India (Delhi) and different results may be obtained in other parts of India.

200. The information in figure 6 is based on measurements made on transmissions after sunset. In interpreting the results obtained at great distances where the service is obtained by indirect ray transmission, the period of time over which the grade of service mentioned will be obtained will be further deteriorated by fading. From figure 6 it will be seen that with a 5 K.W. station with the normal ground conductivity prevailing in northern India assuming a 20 DB signal noise ratio on a 30 per cent. modulated signal it will not be possible to maintain for more than 50 per cent. of the time a range exceeding 50 miles, for 80 per cent. of the time a range of more than 15 miles, and 95 per cent. of the time a range more than 11 miles.

201. For the 20 K.W. station at Delhi the figures are :

50 per cent. of the time 70 miles.

80 per cent. of the time 25 miles.

95 per cent. of the time 20 miles.

(iv) Indirect Ray Measurements.

202. Field strength measurements have also been made at the Receiving Centre, Delhi, at night time of the indirect ray field strength of the mediumwave transmitters at Lahore, Lucknow, Bombay, Calcutta and Peshawar. These signals are in all cases subject to fading and therefore the signal strength is varying from moment to moment. The accuracy of measurements made on indirect ray field strength cannot therefore be as great as when measurements are made on direct ray In the case of indirect ray signals, significance can only be attached to the quasi-maximum value of field strength received and in practice the normally accepted procedure is to determine the quasi-maximum value of the signal. The result of measurements made on the Indian mediumwave stations is shown in figure 7. In order to permit the results from the various stations to be compared the measured figures have all been reduced to the equivalent field strength for one K.W. radiated from the aerial. The inverse distance curve shows the field strength to be expected for one kilowatt radiated based on the formula.

$$E = \frac{300\sqrt{P}}{d}$$

where E is field strength in millivolts per metre

P—power in kilowatts, and

d—distance in kilometres.

203. This expression assumes radiation takes place from a vertical aerial which is short compared to the wavelength

204. Figure 7 shows the theoretical inverse distance field strength and the curve marked C. C. I. R. indicates the measured field strength obtained from a broadcasting station with one kilowatt radiated. This curve is based upon a very great number of measurements made by broadcasting organizations in various parts of the world. These results were discussed at the meeting at Bucharest in 1937 and the average figures are contained in the curve.

205. It will be seen that the field strengths of the mediumwave stations at Lahore, Lucknow and Bombay approach the C. C. I. R. curve. Field strengths from the Calcutta and Peshawar stations fall short of this value. The reason for this in the case of Calcutta is not yet known and investigations will be carried out. It is quite possible that the aerial has a non-uniform horizontal polar diagram and that maximum radiation is not taking place in the direction of Delhi. The reason for low field strengths for the Peshawar Station is due to the unsatisfactory aerial system which cannot be improved due to lack of space. The small values of field strength obtained in some cases is evidently due to restricting the measuring period to too short a time for true quasi-maximum conditions to be obtained.

206. These results are interesting as they tend to show that the indirect ray field strengths of mediumwave stations in India are not appreciably different from any other part of the world. However, these observations have not yet been carried on for a sufficiently long time to enable very definite conclusions to be drawn.

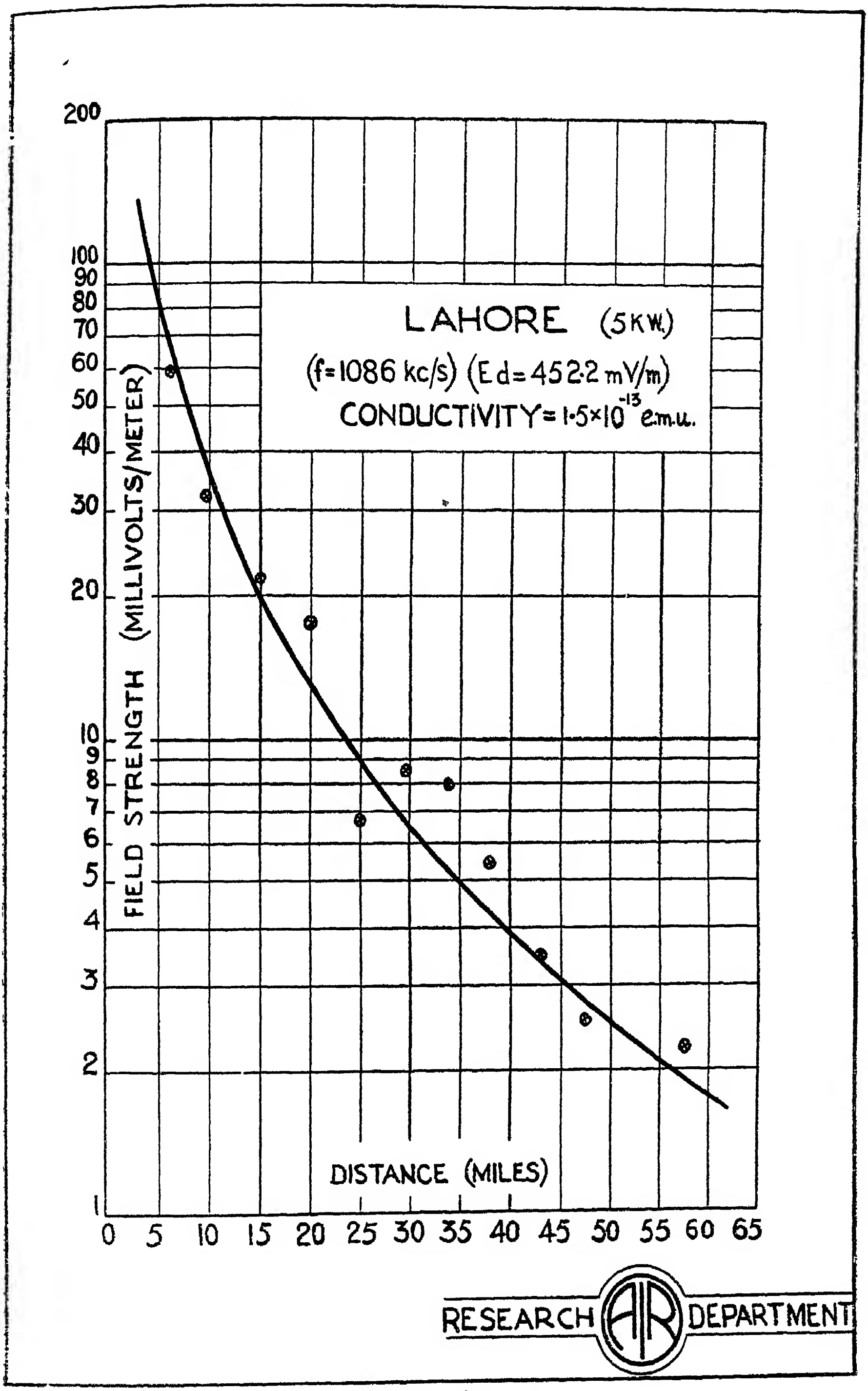

LAHORE (5KW.)
(f=1086 kc/s) (Ed=452.2 mV/m)
CONDUCTIVITY=1.5×10⁻¹³ e.m.u.
FIELD STRENGTH (MILLIVOLTS/METER)
DISTANCE (MILES)
200
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
0 5 10 15 20 25 30 35 40 45 50 55 60 65
RESEARCH AIR DEPARTMENT

FIG. 1

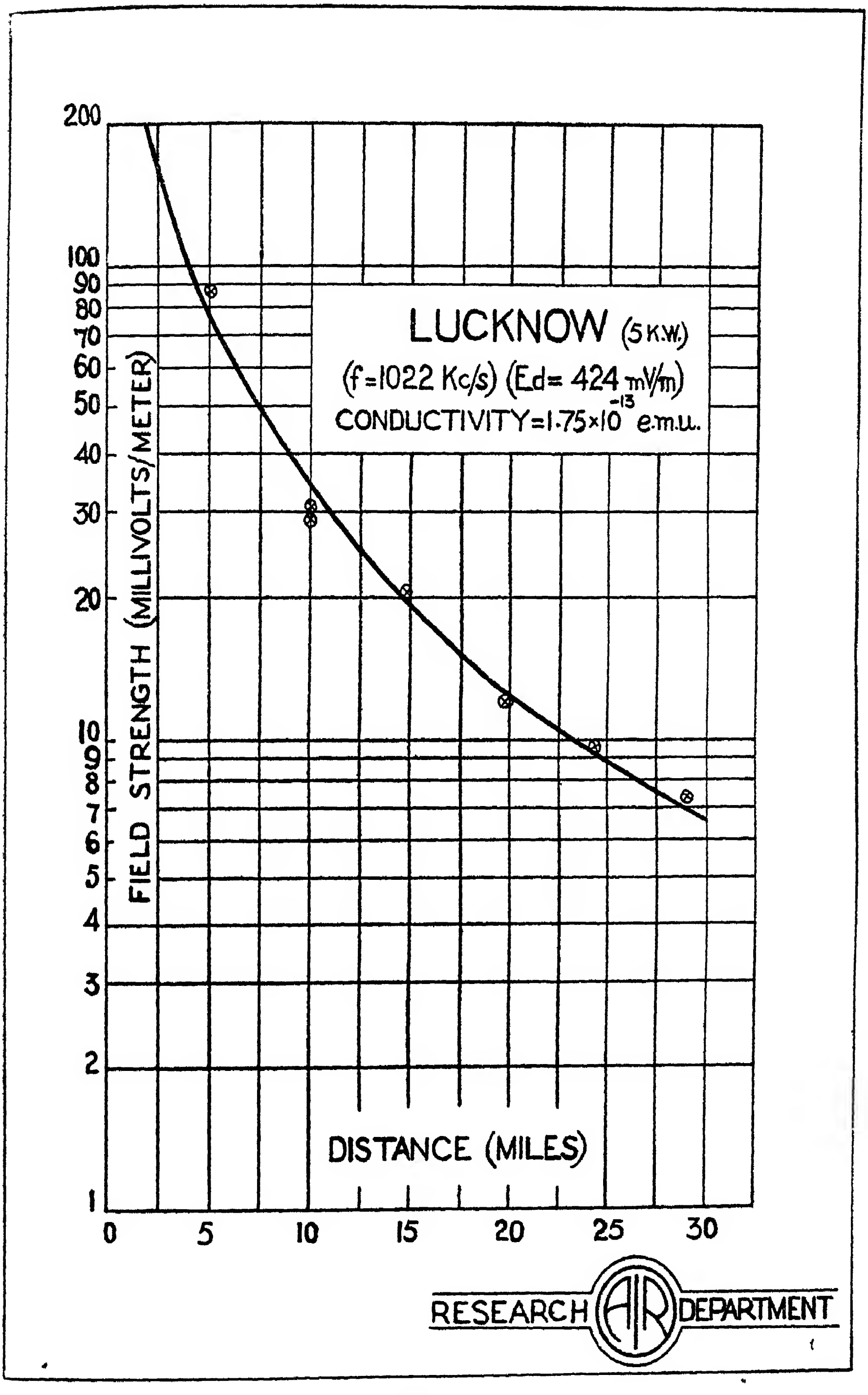
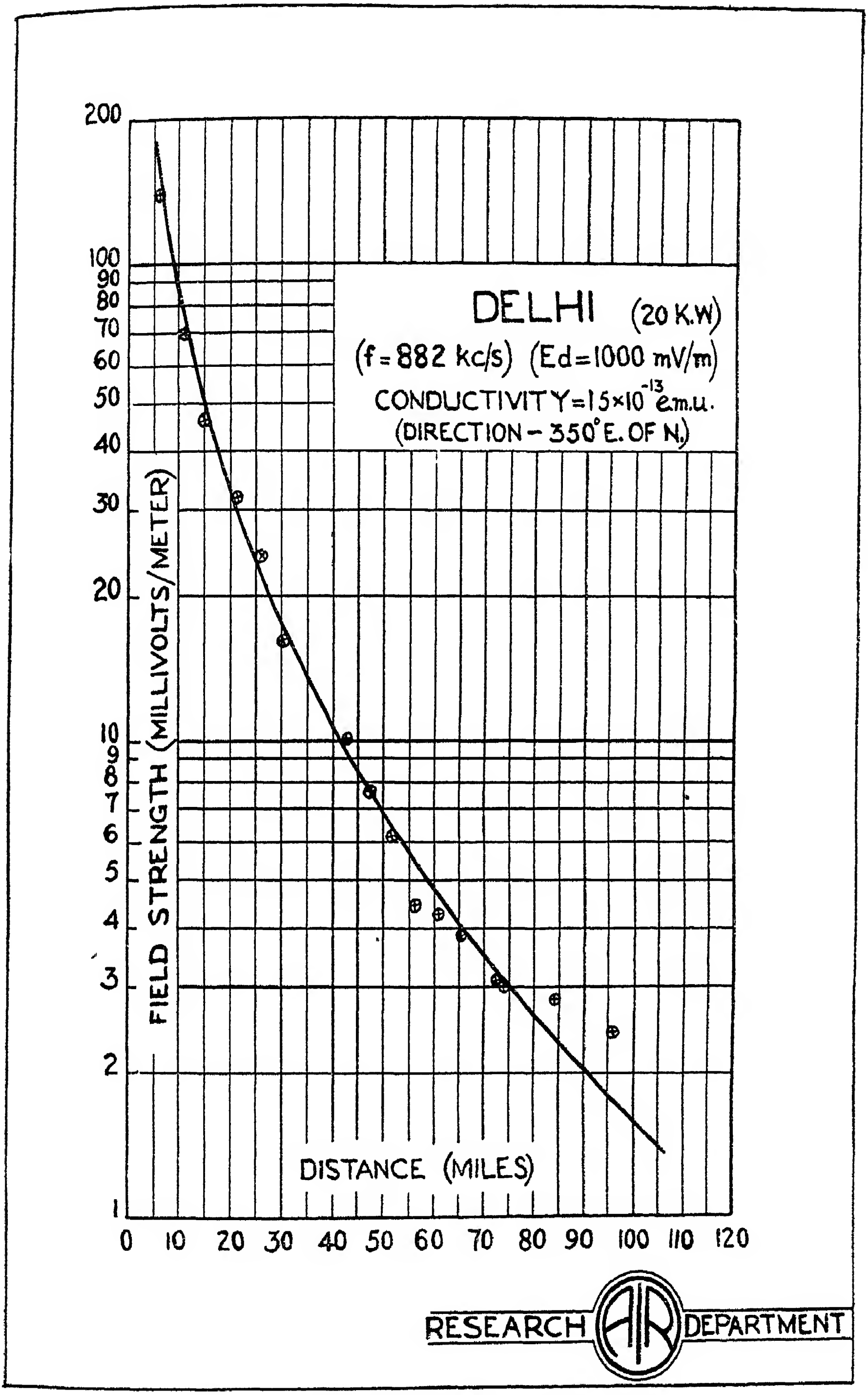

LUCKNOW (5 K.W.)
(f=1022 Kc/s) (Ed= 424 mV/m)
CONDUCTIVITY=1·75×10⁻¹³ e.m.u.
FIELD STRENGTH (MILLIVOLTS/METER)
DISTANCE (MILES)
200
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
0
5
10
15
20
25
30
RESEARCH AIR DEPARTMENT

FIG.2



DELHI (20 K.W)
(f = 882 kc/s) (Ed = 1000 mV/m)
CONDUCTIVITY = 15×10⁻¹³ e.m.u.
(DIRECTION – 350° E. OF N.)
FIELD STRENGTH (MILLIVOLTS/METER)
200
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
DISTANCE (MILES)
0
10
20
30
40
50
60
70
80
90
100
110
120
RESEARCH AIR DEPARTMENT

FIG. 3

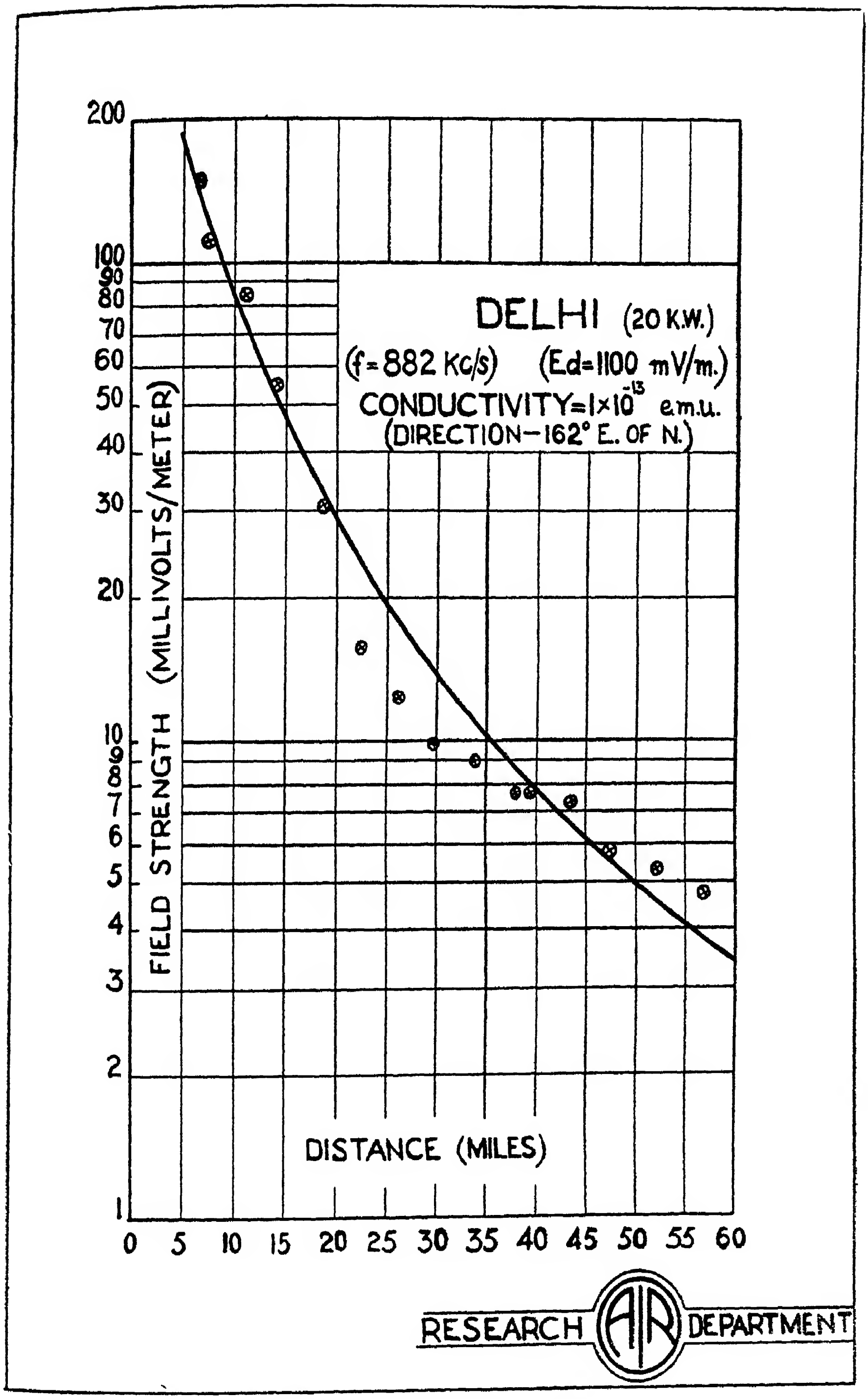

DELHI (20 K.W.)
(f=882 Kc/s) (Ed=1100 mV/m.)
CONDUCTIVITY=1×10^{-13} e.m.u.
(DIRECTION—162° E. OF N.)
FIELD STRENGTH (MILLIVOLTS/METER)
DISTANCE (MILES)
200
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
0 5 10 15 20 25 30 35 40 45 50 55 60
RESEARCH
AIR
DEPARTMENT

FIG. 4

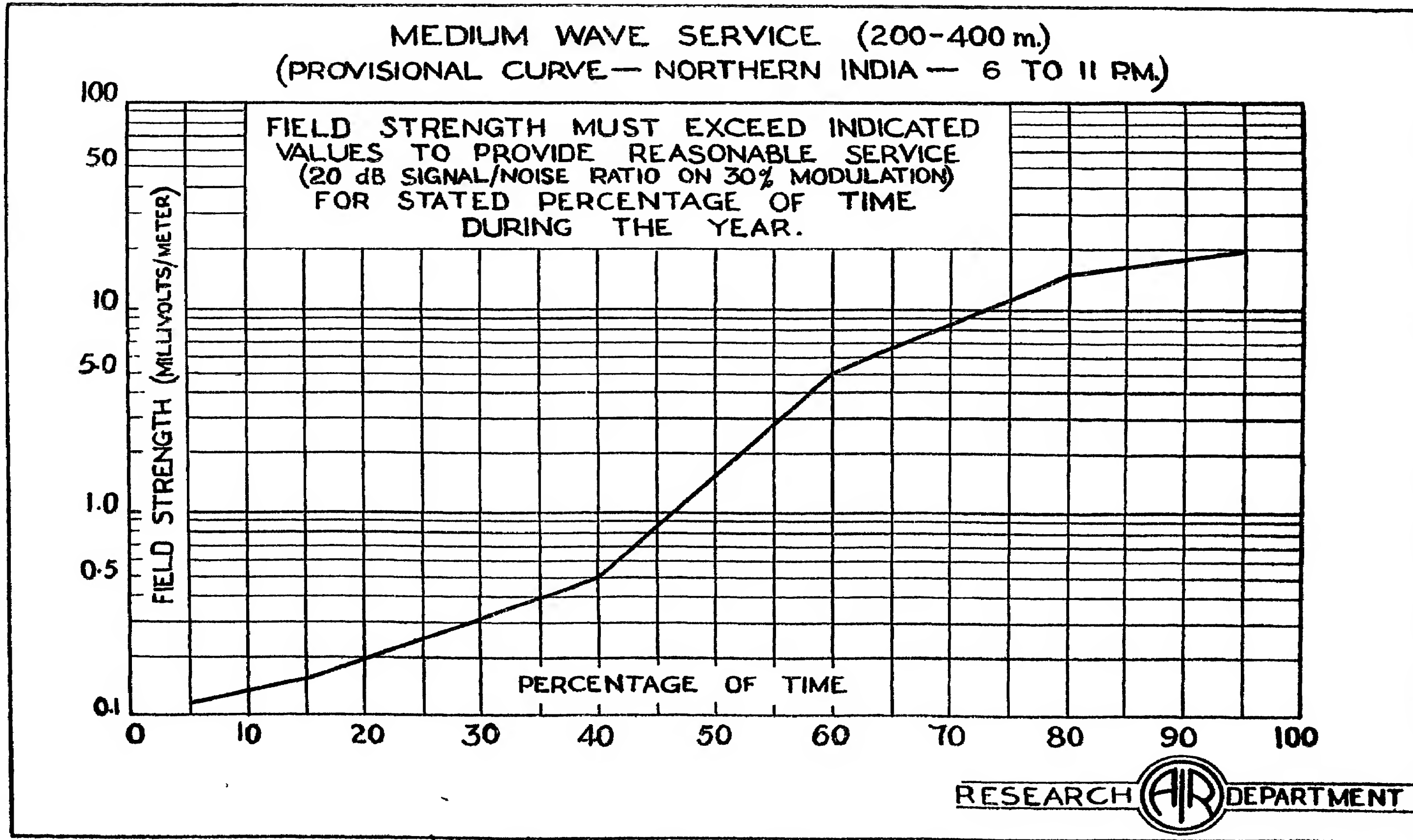

MEDIUM WAVE SERVICE (200-400 m.)
(PROVISIONAL CURVE — NORTHERN INDIA — 6 TO 11 P.M.)
FIELD STRENGTH MUST EXCEED INDICATED VALUES TO PROVIDE REASONABLE SERVICE
(20 dB SIGNAL/NOISE RATIO ON 30% MODULATION)
FOR STATED PERCENTAGE OF TIME DURING THE YEAR.
FIELD STRENGTH (MILLIVOLTS/METER)
100
50
10
5·0
1.0
0·5
0.1
PERCENTAGE OF TIME
0
10
20
30
40
50
60
70
80
90
100
RESEARCH AIR DEPARTMENT

FIG. 5

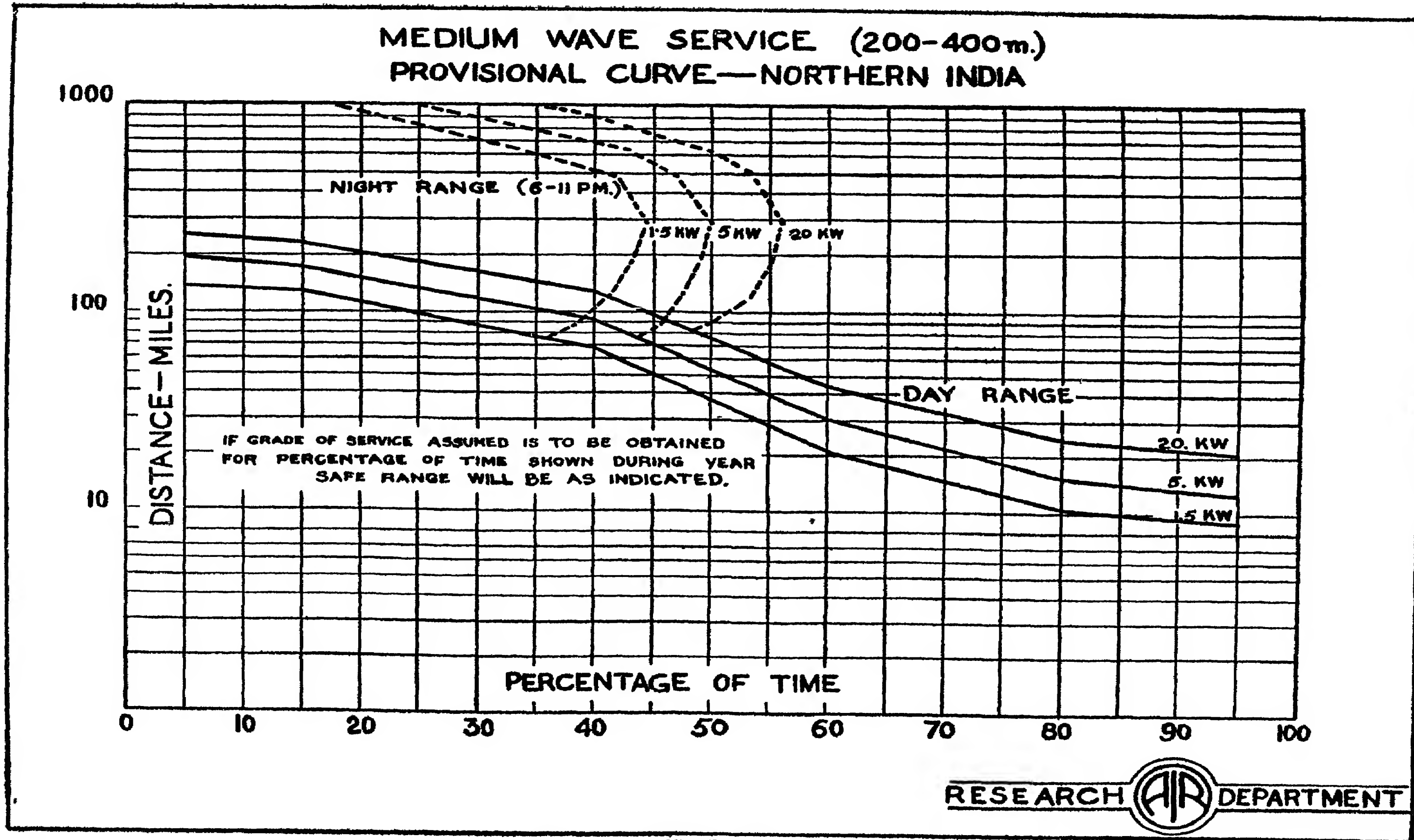
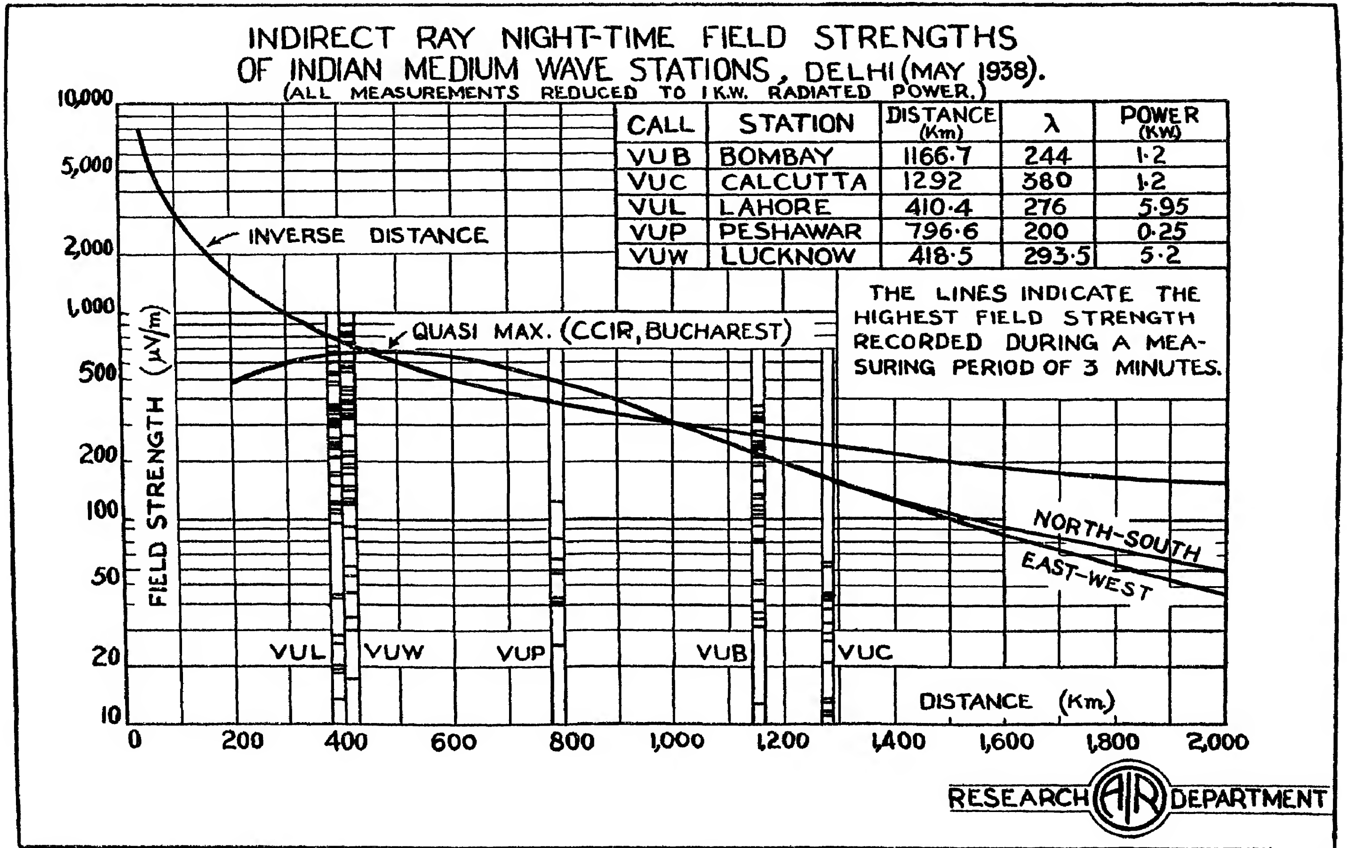

MEDIUM WAVE SERVICE (200-400 m.)
PROVISIONAL CURVE—NORTHERN INDIA
1000
100
10
DISTANCE—MILES.
NIGHT RANGE (6-11 PM.)
1·5 KW
5 KW
20 KW
DAY RANGE
20. KW
5. KW
1.5 KW
IF GRADE OF SERVICE ASSUMED IS TO BE OBTAINED FOR PERCENTAGE OF TIME SHOWN DURING YEAR SAFE RANGE WILL BE AS INDICATED.
PERCENTAGE OF TIME
0
10
20
30
40
50
60
70
80
90
100
RESEARCH AIR DEPARTMENT

FIG. 6



CALL	STATION	DISTANCE (Km)	λ	POWER (KW)
VUB	BOMBAY	1166·7	244	1·2
VUC	CALCUTTA	1292	380	1·2
VUL	LAHORE	410·4	276	5·95
VUP	PESHAWAR	796·6	200	0·25
VUW	LUCKNOW	418·5	293·5	5·2

FIG. 7

SECTION 3.

The Shortwave Service.

207. It will be evident from the report dealing with the mediumwave stations that the total area covered by a direct ray service from the mediumwave stations in existence at the conclusion of the present development programme will only represent a small fraction of the total area of India At night time the mediumwave stations will provide an indirect ray service over a greater area than this but will still not meet the requirement that a measure of service shall be given to the whole of India. The limitation to the indirect ray service area of the mediumwave stations is atmospheric disturbances The magnitude of these disturbances on the short wavelengths is very much less than on the medium wavelengths (see Section 4 'The Measurement of Atmospheric Disturbances'). A great increase in the indirect ray service area of a station is therefore obtained by operating broadcasting stations on the short wavelengths. There is also the important consideration that a shortwave station can provide an indirect ray long distance service by daytime as well as by night time, whereas a mediumwave station can only provide an indirect ray service at night time.

208. These considerations have led to the establishment of four 10 K.W. shortwave stations, so placed that the whole area of India will be given a service under normal conditions. The stations are located at Delhi, Bombay, Madras and Calcutta, and their normal effective range may be taken as 500 miles, although under favourable circumstances much greater distances than this will be covered. With these shortwave stations in operation no part of India will be outside the range of a broadcasting station either by day or by night. The shortwave service is, however, a second grade or indirect ray service and consequently the transmission will be subject to fading. The extent of fading is dependent upon the state of the upper atmosphere or ionosphere. During periods of high sunspot activity the ionosphere may be seriously disturbed, which will affect shortwave transmission, whereas during periods of low sunspot activity relatively stable conditions will prevail. The frequency and magnitude of sunspot disturbances varies very markedly with the solar cycle of sunspot activity covering a period of eleven years. The period of maximum activity will be reached in 1939-40 and the next period of minimum activity in 1944-45. It is to be expected therefore that there will be occasions on which the shortwave service will be disturbed, and this will apply equally to the Indian shortwave stations as to the distant European shortwave stations. In so far as a shortwave is not completely reliable it is unsatisfactory. It is, however, considered of first importance to provide some measure of service to the whole country as an initial step in the broadcasting development programme, and it is only through a shortwave service that this can be done. The subsequent stages in the development programme for broadcasting in India will be the establishment of additional mediumwave stations to give a direct ray service. The satisfactory coverage of India with a direct ray service will however involve an expenditure of an even greater magnitude (owing to atmospheric disturbances) than has been incurred in western countries of a

similar area. A capital expenditure of 10 crores of rupees may be taken as an approximate minimum figure to provide a direct ray service to the greater part of the country.

209. The provision of a shortwave indirect ray service such as is required in India involves a number of special considerations. The principal purpose of the shortwave stations under consideration is to serve the area in which they are located (*i.e.,* the Bombay Shortwave Station is intended primarily to provide a service to the Bombay Presidency). This is in sharp contra-distinction to the general mode of operation of shortwave services such as the present shortwave services radiated from the European countries. In these cases the programmes are not intended for the country in which the station is located, but for areas often at very great distances from the country of origin. The result of these varying requirements is a difference in the wavelength of operation of the Indian shortwave stations compared with other shortwave services. To provide a service from a shortwave station in the area in which it is located a wavelength must be employed which does not give ' skip distance ' around the shortwave station. It is known from general principles that to provide such a service, wavelengths between 50 and 100 metres are required at night time and between 25 and 50 metres during the day time. Extensive field strength measurements made during the winter on the Delhi shortwave station before its inauguration showed that the service required could be obtained by operating the station on a wavelength of approximately 90 metres. Measurements made at a later date indicated that wavelengths of the order of 60 metres were more satisfactory—at least for the early summer months. A wavelength of 31 metres is used during the daytime transmissions.

210. It is necessary to appreciate the special conditions involved in a shortwave service of the present type. The use of short wavelengths to provide a service without skip distance will result in certain important differences in the mode of propagation of the waves from the transmitting station to the receiving point through the ionosphere In the case of a long distance shortwave service it is known that it is only the energy which is radiated at low angles from the transmitting aerial (5° to 15° to the horizontal) that is effective in reaching the receiving station. In long distance services, therefore, it is possible to suppress high angle radiation and concentrate this energy in a low angle beam so that the energy radiated from the transmitting aerial is contained within a vertical angle of 15°.

211. The conditions are very different when it is required to provide a shortwave service without skip distance over relatively short distances. Assuming that at night time the effective height of the ' F ' Layer in the ionosphere is 300 kilometres and that no skip distance is permissible, it is evident that the transmitting aerial must radiate energy vertically which on striking the Heavyside layer at essentially normal incidence will be returned to earth near the transmitting station. On the other hand at the edge of the normal reliable service area (taken to be 500 miles) the angle of incidence at which the indirect ray strikes the ' F ' Layer will be 45° Under normal conditions a service can be given at much greater distances than 500 miles, which will therefore involve smaller

angles of incidence than 45°, and in fact in order to take advantage of favourable winter conditions radiation should take place on low angles of 5° to 15° to the horizon as well. To meet these conditions it is evident that the transmitting aerial employed must radiate energy at all vertical angles. As uniform radiation is also required in the horizontal plane it is equivalent to saying that the aerial system employed should have roughly uniform radiation in all angles both in the vertical and horizontal planes. A simple vertical aerial one quarter wavelength high would most nearly meet these conditions. However, for various reasons which cannot be discussed now, it is known as the result of a great deal of experience in shortwave transmission that a vertical aerial will not provide as satisfactory a field strength as a horizontal aerial—especially at low angles of radiation It therefore remains to determine the most satisfactory arrangement of a horizontal aerial to meet the conditions outlined above. The principal factors under control permitting the polar radiation diagram of a horizontal aerial to be modified are the distance from the earth that the aerial is placed, and the length of the aerial. In order that, as far as possible, uniform radiation shall be obtained in the horizontal plane, the length of the aerial must be restricted to half a wavelength. It is true that in the horizontal plane uniform radiation is not obtained from a half wave dipole, but at higher angles to the horizontal the radiation becomes essentially uniform and it is this energy which is effective for shortwave transmission rather than the energy radiated tangentially to the surface of the earth. The two extremes available in the adjustment of the vertical polar diagram are when the aerial is a quarter wavelength above the earth—in which case there is maximum radiation at high angles ; and when the aerial is half a wavelength above the earth—in which case the maximum radiation is obtained at low angles. Greater heights above the earth are of no practical interest. At intermediate distances from the earth between a quarter and a half wavelength modification of the polar diagram between the above extremes takes place. At heights greater than half a wavelength radiation is split up into numerous lobes at angles varying with the height of the aerial, which is not desirable under the circumstances of operation of the service described above.

212. The choice of aerial height rests therefore between a quarter and half wavelengths above the earth. In practice it has been found that the aerial is best placed half a wavelength above the earth. This at first sight would appear unsatisfactory as theoretically no radiation is projected vertically and low field strengths would be obtained up to several hundred miles around the transmitting station. The condition of low vertical radiation from a horizontal dipole half a wavelength above the earth is however based on a number of theoretical considerations which are not met in practice. The most important inaccuracy is in the difficulty of locating the aerial exactly half a wavelength above the earth. The degree of suppression of vertical radiation varies rapidly with deviation of the height from the true half wave position. There is also the consideration that the physical surface of the earth does not necessarily represent the electrical earth—the effective electrical earth is some distance below the actual surface of the earth. There is also the consideration that the mast stays and transmission lines associated with the horizontal

aerial are excited and re-radiate energy at high angles. Although theoretically at a distance of, say, 50 miles from the transmitting station where the ground ray is negligible and the ray returned from the ionosphere is essentially perpendicular there should be a very high ratio between the field strength measured when using a horizontal aerial a quarter wavelength above the earth and a horizontal aerial half a wavelength above the earth, the maximum ratio it has been possible to obtain in practice in a number of experiments has been 5 to 1 and more often 3 to 1. In an endeavour to increase this ratio by obtaining the minimum vertical radiation possible a vertical half wave aerial with the lower end at the surface of the earth was erected This type of aerial, which is used in the form of a half wave mast radiator for mediumwave broadcasting stations provides the minimum vertical radiation that it is possible to obtain with aerials not exceeding half a wavelength in length. Even in this case the field strength ratio between a horizontal dipole aerial quarter wavelength above the earth and the vertical aerial did not exceed 5 to 1. This is also ascribed to re-radiation from the masts, guy wires, and transmission lines on the site. The vertical aerial referred to was supported from a triatic running between two towers. In the case of the broadcast tower antenna, the conditions are more favourable, as there are no other structures in the vicinity which can radiate, and hence a much more satisfactory suppression of high angle radiation is obtained. The conclusion drawn from these experiments is therefore that a horizontal dipole can be erected a quarter wavelength above the earth or a horizontal dipole half a wavelength above the earth, the former providing field strengths 3 to 5 times greater within the first two or three hundred miles from the transmitting station, while the field strength at great distances is considerably higher from the aerial half a wavelength above the earth due to the increased low angle radiation.

213. If the field strength within the first few hundred miles from the transmitting station with the aerial half a wavelength above the earth is sufficient to give a satisfactory signal/noise ratio there is every advantage in placing the aerial at this height, as a considerably better service will be obtained at longer distances. It is found from field strength measurements that ample field strength can be obtained at near distances with such an aerial and, therefore, the transmitting aerials for the shortwave service at Delhi, Bombay, Calcutta and Madras are arranged in this manner.

214. A further unusual effect is evident in field strength measurements under the particular circumstances of operation explained. At a relatively short distance from the transmitting station the ground ray will be reduced to negligible proportions This distance does not generally exceed ten miles from the transmitting station. At distances beyond this point the signal reaching a receiving aerial returned from the 'F' Layer will have travelled, say, 600 kilometres—even though the receiving point may be only 30 or 40 kilometres from the transmitting station. Further, until the distance of the receiving point from the transmitting station is comparable to the height of the layer, the length of the path over which the signal has travelled will be nearly independent of the distance of the receiver from the transmitting station. Assuming a normal night time height of 300 kilometres for the 'F' Layer, it is evident that the length

of the signal path to a point 300 kilometres distant from the transmitter is 670 kilometres whereas the minimum path length at a point outside the ground ray area is 600 kilometres. At a distance of 600 kilometres from the transmitting station the path length has only increased from 600 kilometres to 900 kilometres.

215. The expected result of this when taking field strength measurements at increasing distances from the transmitting station would be to show practically constant field strength up to several hundred kilometres from the transmitting station, assuming that the coefficient of reflection of the ionosphere were constant. In practice the coefficient of reflection of the ionosphere will tend to increase as the angle of incidence becomes less. The coefficient of reflection will be less for rays returned near the transmitting station than for rays returned at greater distances. The extent of this variation will depend upon the proximity of the wavelength under consideration to the critical frequency at which such rays are no longer returned to earth for vertical incidence. The result of the small increase of path length which takes place up to 600 kilometres distance from the transmitting station and the increase of the coefficient of reflection of the ionosphere for rays returned at greater distances may result in the rather unusual condition that the field strength increases with distance from the transmitting station for the first few hundred kilometres. A considerable amount of control can be exercised by adjusting the height of the aerial above the earth as previously explained. With an aerial quarter wavelength above the earth the field strength may be made to decrease with distance from the transmitting station while with an aerial half a wavelength above the earth the field strength generally tends to increase with distance from the transmitting station up to a maximum value.

(i) Effective Range of Shortwave Stations.

216. The effective range obtained from the shortwave stations will be limited by signal/noise ratio exactly as in the case of mediumwave stations. There is, however, one marked difference, in that when the service area of a mediumwave station is most restricted due to noise, it is in general due to atmospheric disturbance whereas, as the wavelength is gradually reduced, a point is reached where the signal/noise ratio is limited by the noise from electrical machinery, etc., and not by atmospherics. By far the most serious limitation on shortwave reception in India is the noise resulting from the operation of D. C. ceiling fans. In practically every city in India a D. C supply only is available and only in the large cities is a gradual changeover being made to A. C. supply. During the summer months for a greater part of the 24 hours there are a number of D. C. motor ceiling fans in operation. These fans are not generally attended to unless they completely break down. The result is that a great number of fans are in operation in which the commutator is in an unsatisfactory condition and hence causes serious disturbance. It is extremely difficult, if not impossible, to determine what field strengths are required on the shortwaves to give a satisfactory service, as the conditions vary widely within an area of a few hundred yards. However, as a first

approximation the following figures may be taken as the minimum satisfactory field strengths for reasonable service :—

Wavelength		Minimum field strength required during the summer months.
13 to 32 metres ..	..	1 mv. per metre.
32 to 64 metres ..	..	2 mv. per metre
64 to 128 metres ..	..	4 mv. per metre.

217. In contrast to the above figures it is evident of course that during the winter months field strengths required for shortwave reception will be limited by the normal conditions of general noise and static noise and will not differ appreciably from conditions in Europe and elsewhere. In winter months field strengths of a hundred microvolts per metre are satisfactory.

218. Taking the above provisional figures for field strengths required under the worst conditions it is possible to estimate roughly the expected range of shortwave transmitters from a knowledge of the power of the station and assuming that the field strength decreases proportionately with the length of the path. A field strength of 2 millivolts per metre on a wavelength of 60 metres will be obtained at approximately 500 miles with an aerial power of 10 K.W. and a half wave dipole half a wavelength above the earth.

SECTION 4.

The Measurement of Atmospheric Disturbances.

219. From the month of May to October atmospheric disturbances represent the greatest single technical difficulty to be met with in India in providing a satisfactory broadcasting service. In order to be able to estimate over what area satisfactory reception of the Indian stations will be obtained, it is necessary to determine the magnitude of the atmospheric disturbances on the various wavelengths used for broadcasting and from this to estimate the strength of signal required to overcome the disturbances.

(i) The Nature of Atmospherics.

220. The most satisfactory method of regarding an atmospheric is to consider it as a transient disturbance produced by an electrical discharge A transient of this nature with a sharp wave front can be analysed by a Fourier series into a fundamental component and an infinite series of harmonics The higher the order of the harmonic the less will be its amplitude. These harmonics extend over the frequency range used for wireless communication from the lowest frequencies to the highest frequencies, and as the amplitude of the higher order of harmonics is progressively decreasing, it is evident that the component of disturbance on the higher frequencies (short wavelengths) will be less than on the lower frequencies. The calculated magnitude of the components at the various frequencies resulting from the Fourier analysis will be modified to a great extent in practice by the conditions under which they travel through ether. The disturbance may be propagated through the ionosphere, or, in the case of nearby disturbance, by direct ray transmission.

(ii) Local and Long Distance Atmospherics.

221. Atmospheric disturbances can be divided according to their behaviour into two main groups :—

(*a*) long distance atmospherics,

(*b*) local atmospherics.

222. In the case of long distance atmospherics the following considerations are important :—

(1) The atmospheric disturbance will be propagated through the ionosphere in the same manner as any long distance signal would be propagated, and therefore the amplitude of the disturbance on any wavelength due to the component of the atmospheric disturbance on that wavelength will be modified by the propagation characteristics of the ionosphere. This may result, for example, in the day time atmospheric disturbance on the higher frequencies (*e.g.*, 20 mc/s) being greater than on the lower frequencies for which propagation conditions are less favourable. It may be expected that for long distance atmospherics the disturbance will be most noticeable at the frequency for which propagation through the ionosphere is most favourable at that particular time of day between the source of the atmospherics and the point of observation.

(2) In the general case, long distance atmospherics are directional, that is, for a large part of the time the direction of arrival of the atmospheric disturbance will be found to come from specific zones of disturbance

223. In the case of local atmospherics the conditions are found to be very different. The significance of local atmospherics is far greater from the point of view of disturbance to a broadcasting service than long distance atmospherics as the amplitude of the disturbance is very much greater. It is the amplitude of the local atmospheric disturbance which usually limits the service area of a broadcasting service in India in the summer months. The particular characteristics of local atmospheric disturbances are as follows :—

(1) In the general case during the summer months in India the major part of the disturbance is propagated by the direct ray. Contrary therefore to the case of the long distance atmospheric the ionosphere does not affect the amplitude of the disturbance, whereas the ground conductivity will do so, as for a given conductivity the absorption of a wave increases with frequency. It may therefore be expected that the amplitude of the local atmospheric disturbance will decrease more rapidly with increase of frequency than long distance atmospherics as it is a function of the component of the Fourier series (which is decreasing with the increase of frequency) and also a function of ground conductivity which causes greater absorption with the increase of frequency. This is found to be the case in the measurements which are discussed later.

(2) Another characteristic of the local atmospheric disturbance is that the direction of arrival of the disturbance is random, as it depends upon the position of a local thunderstorm which may occur at any point of the compass. It is evident from these considerations that whereas a directive aerial system for shortwave reception would give an increase of signal to noise ratio on long distance atmospherics if the normal zone of atmospheric disturbance were different from the direction from which reception is required, for local atmospheric disturbance the improvement obtained would be problematical as the zone of disturbance would vary from day to day, and might arrive from the same direction as the desired signals.

(iii) Measurement of Atmospherics.

224. The methods adopted for the measurement of atmospheric strengths depend very much upon the objects in view in making these measurements. From the point of view of the development of a broadcasting service, the chief consideration is evidently the extent to which such a service is disturbed. This immediately makes it necessary to define the conditions under which atmospheric disturbance is objectionable. This cannot be done in an absolute manner as it is essentially dependent upon the human factor. The criterion of a broadcast service is the listener, and it depends upon the judgment of the average listener as to what strength of atmospheric disturbance constitutes objectionable disturbance and what strength of disturbance is tolerable. This makes it very difficult to know in what manner to express the magnitude of atmospheric disturbances. Methods of measurement could be adopted which indicate the peak value of disturbance but this in itself is not satisfactory, unless the frequency of occurrence of these disturbances is also taken into consideration. There is a very great difference in the disturbing factor of an atmospheric crash recurring every second and a continuous disturbance of equal amplitude. The technique of noise measurement has been studied at considerable length in connection with the measurement of noise levels on telephone systems and industrial noise and somewhat rigid specifications have been laid down for the measuring method but it has not yet been possible to adopt these particular methods in connection with the measurement of atmospherics in India.

225. The particular purpose of the measurements about to be described was to determine the relation between the extent of atmospheric disturbance and frequency in order to be able to judge the extent of the improvement to be obtained by operating broadcasting stations on the higher frequencies (short wavelengths).

226. It was eventually decided that the most satisfactory method of obtaining the information required was to adopt a system of measurement which necessitated adjusting the strength of a locally generated signal or carrier at different selected wavelengths until in each case the disturbance due to atmospherics was the same. The strength of the locally generated signal then indicates the field strength required for a broadcasting station on the various frequencies chosen to give an equal service (or signal/noise ratio).

227. The measurement is actually carried out by connecting to a radio receiver a vertical aerial of known effective height and introducing in the earth lead of the receiver a signal from a signal generator of known strength (see Fig. 1). If the receiver is supplied with automatic volume control the extent of the atmospheric disturbance as heard in a loud-speaker will decrease as the output from the local signal generator is increased. Quite valuable information can be obtained by adjusting the output of the signal generator on the different wavelengths until the disturbance value of the atmospherics is judged by the ear to be the same on the various wavelengths, and this method has the advantage that it is basically sound as the disturbance as judged by the ear is the ultimate criterion.

228. In addition, quantitative measuresments were also made in the following manner :—

229. The signal generator was modulated with a 30 per cent. tone source. The radio frequency output from the signal generator was then adjusted until the indication given by a valve voltmeter connected across the output of the receiver showed a ratio of 20 DB in deflection between the deflection obtained from the 30 per cent. modulated tone and the deflection given by atmospherics without the modulated tone but in the presence of the carrier from the signal generator. This is equivalent to stating that the measurement indicates the carrier strength required to give a 20 DB signal/noise ratio between a 30 per cent. modulated carrier and atmospheric noise.

230. The particular values of 30 per. cent. and 20 DB were chosen as a matter of convenience The results obtained can be modified for any other signal/noise ratio or percentage modulation accordingly.

231. Knowing the output of the signal generator in series with the earth connection of the receiver, it is then necessary to determine the signal strength that this represents at the input of the receiver. This is determined by transferring the signal generator with a known output from the series position to a position across the input terminals of the receiver and in this manner the field strength at the input terminals of the receiver for a given output from the signal generator in series with the earth lead can be determined. From this value of field strength at the input terminals of the receiver the carrier field strength required at the receiving aerial in microvolts per metre can be determined by dividing this value by the effective height of the vertical aerial, which is readily calculated.

(iv) Results of Measurements.

232. The curves (Figs. 2—12) give representative results obtained by this method of measurement. The curves are in a form which shows the field strength required in microvolts per metre with a 30 per cent. modulated carrier to give a 20 DB signal/noise ratio between the modulated carrier and atmospheric disturbance on various wavelengths.

233. It is seen that the curve for one frequency very rarely crosses over the curve of another frequency, which indicates that the source of disturbance is essentially due to local atmospherics and consequently not

influenced by any selective action of the ionosphere against frequency. It is also evident that the magnitude of atmospheric disturbance drops rapidly with decrease of wavelength. It is sometimes assumed that the amplitude of atmospheric disturbance varies inversely as frequency. This may be expected in free space but in the case of local atmospherics propagated largely along the surface of the earth the increased attenuation on the higher frequencies due to ground absorption is very marked. In some cases the extent of the atmospheric disturbance varies more nearly inversely as the square of the frequency. This indicates the importance to be attached to the use of the shorter wavelengths for a broadcasting service under such conditions.

234. Another point of interest evident from the curves is the diurnal variation of atmospheric strength. A very marked decrease in the magnitude of atmospheric disturbance is noticeable in the late morning period. These measurements on atmospheric strengths have been of assistance in determining the service area to be anticipated from the new medium and short wave stations which are now being installed and the effect of operation on various wavelengths. Information on the estimated service areas of the various stations based on these measurements is given elsewhere in this report (Sections 2 and 3).

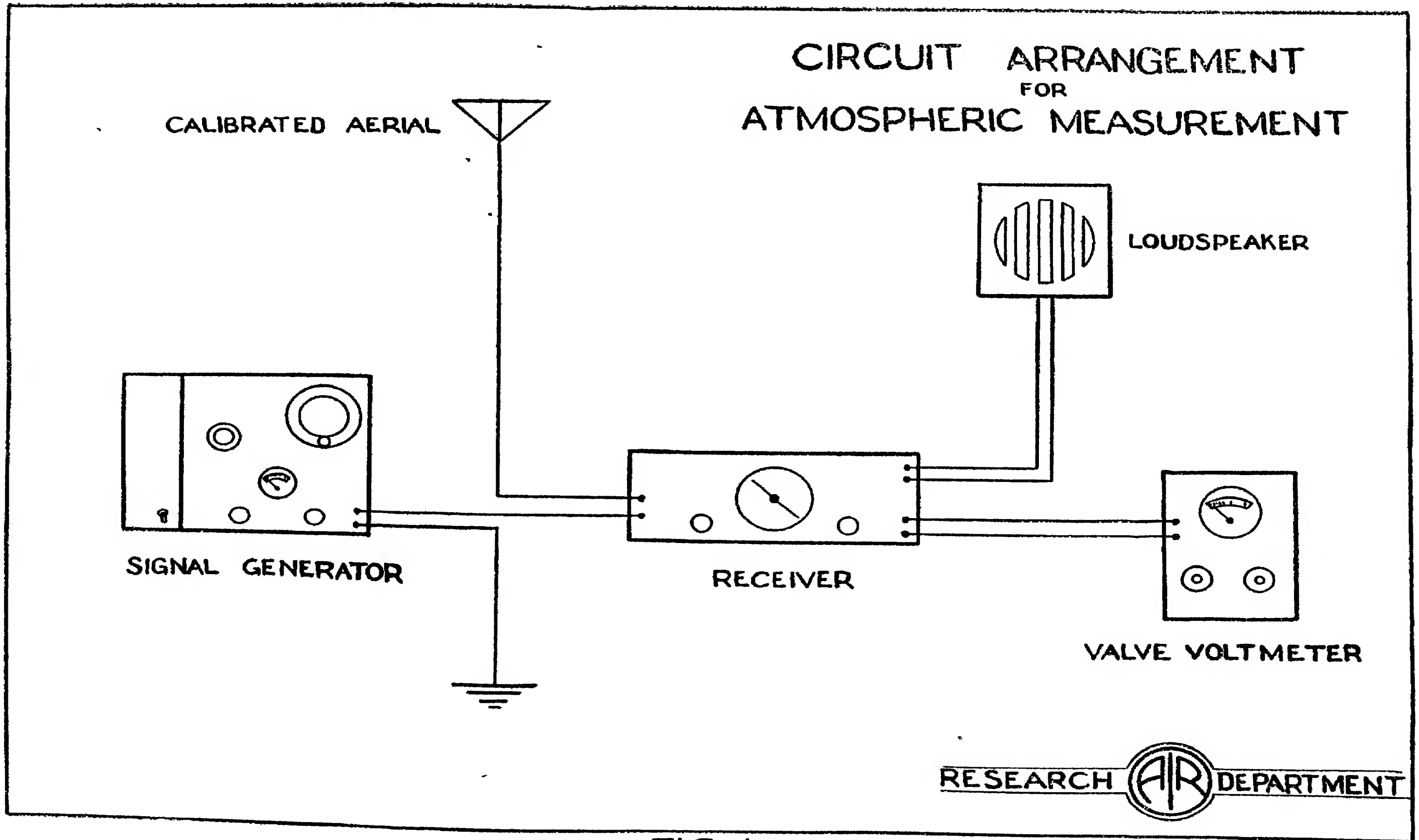

CIRCUIT ARRANGEMENT
FOR
ATMOSPHERIC MEASUREMENT
CALIBRATED AERIAL
LOUDSPEAKER
SIGNAL GENERATOR
RECEIVER
VALVE VOLTMETER
RESEARCH DEPARTMENT

FIG. 1

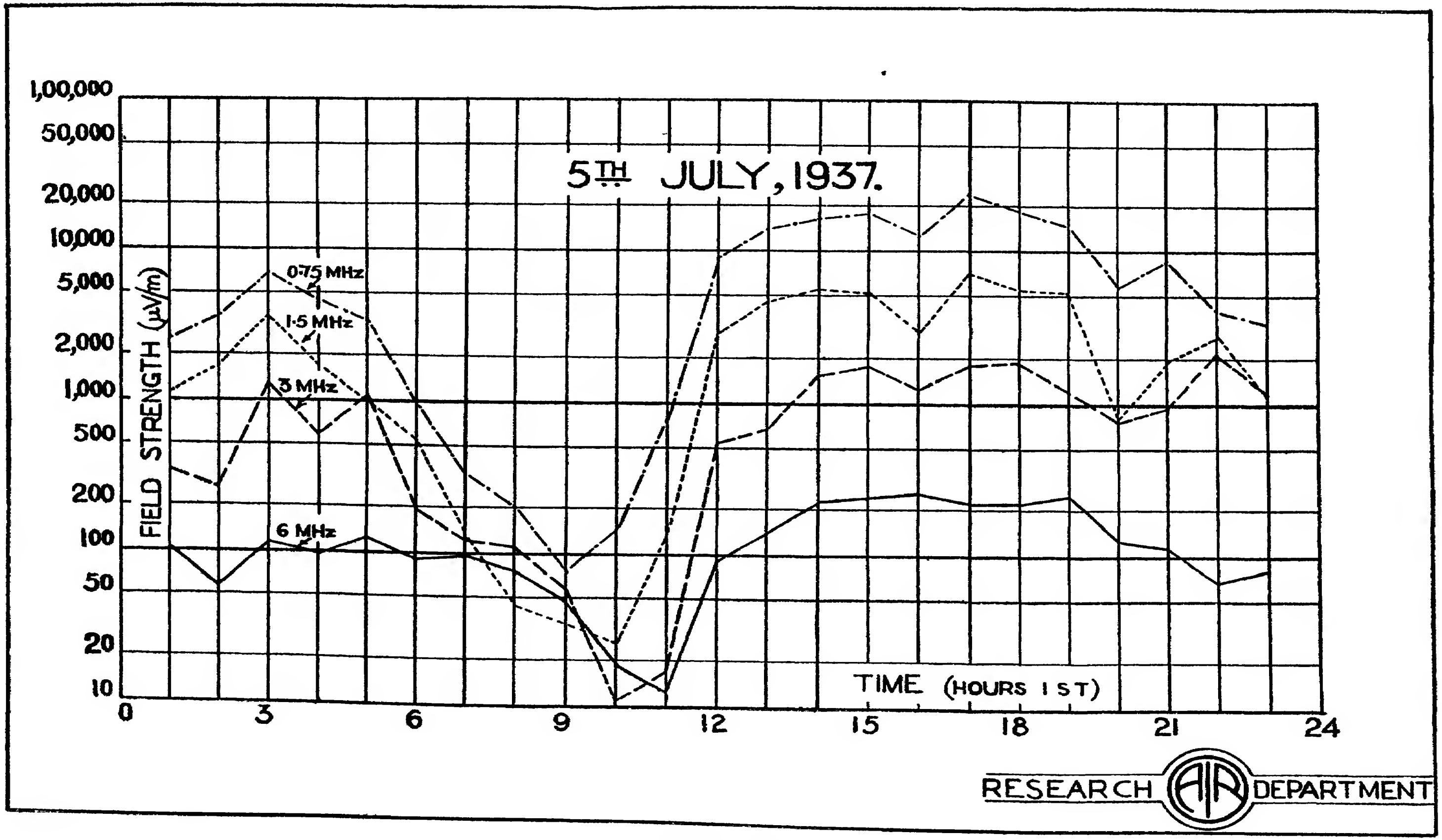

5TH JULY, 1937.
1,00,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
FIELD STRENGTH (µV/m)
0·75 MHz
1·5 MHz
3 MHz
6 MHz
0
3
6
9
12
15
18
21
24
TIME (HOURS I S T)
RESEARCH AIR DEPARTMENT

FIG.2

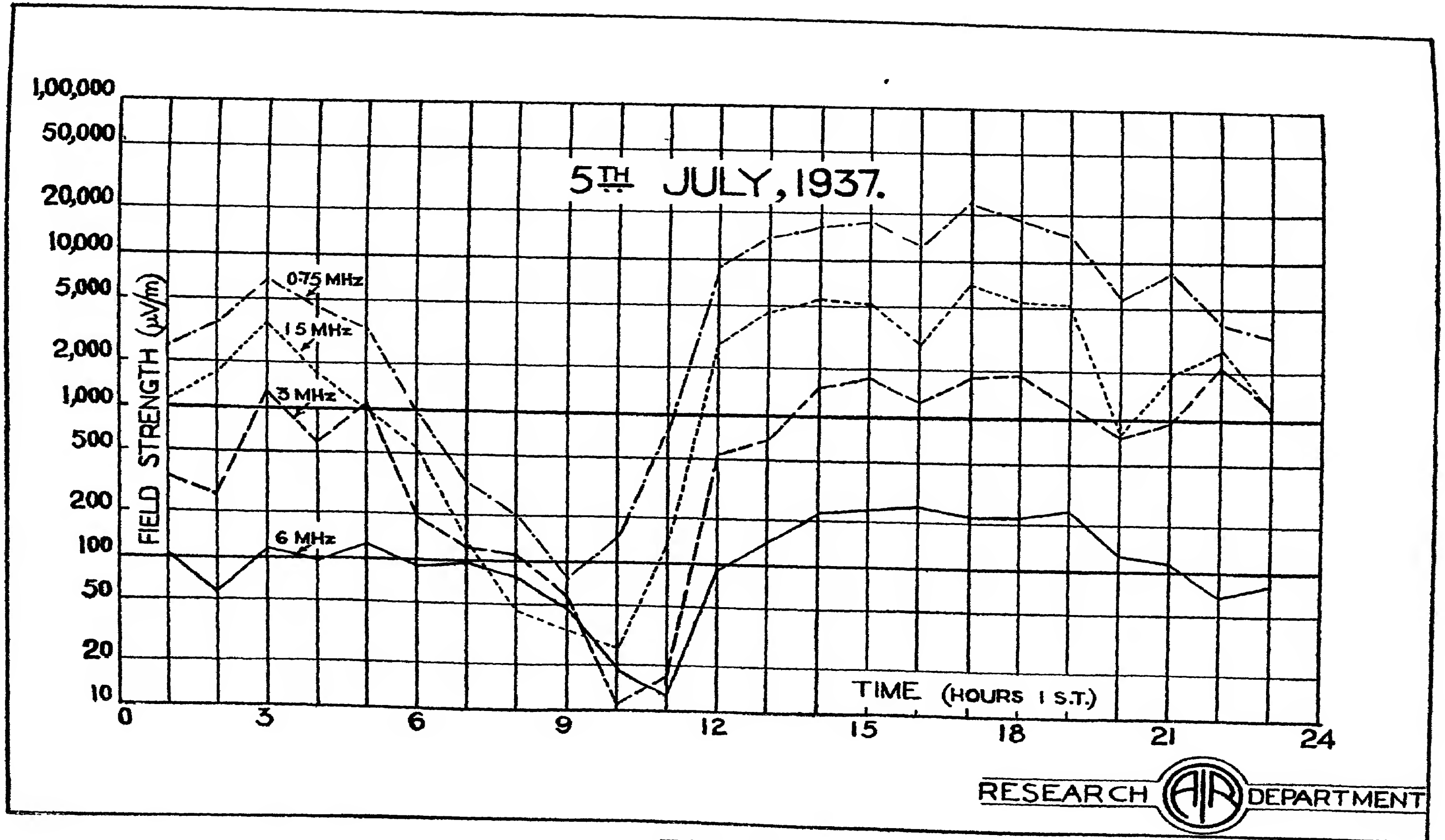
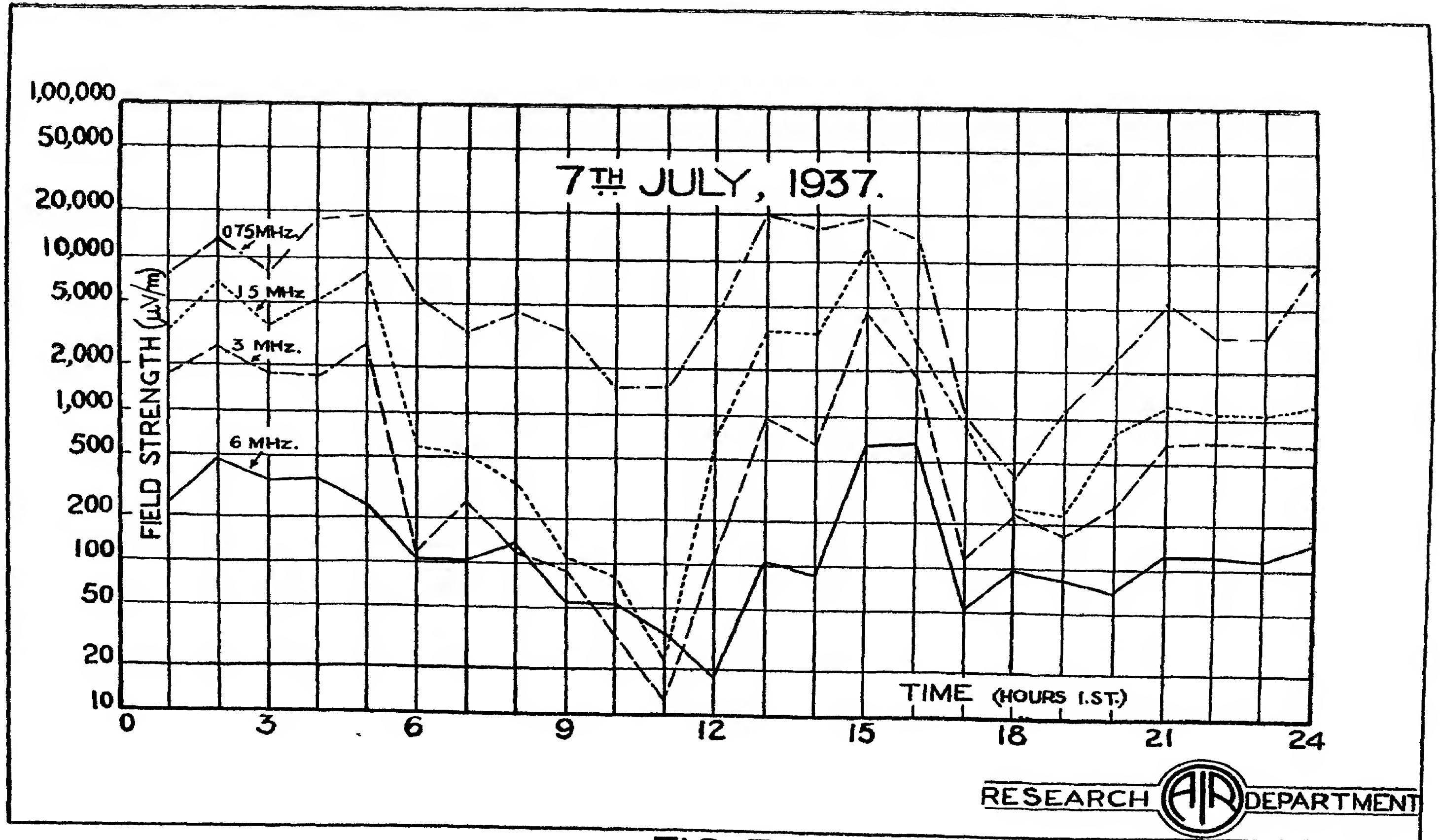

5TH JULY, 1937.
1,00,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
FIELD STRENGTH (μV/m)
0·75 MHz
1·5 MHz
3 MHz
6 MHz
0
3
6
9
12
15
18
21
24
TIME (HOURS I S.T.)
RESEARCH DEPARTMENT

FIG.2



7TH JULY, 1937.
1,00,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
FIELD STRENGTH (µV/m)
.075MHz.
1.5 MHz
3 MHz.
6 MHz.
0
3
6
9
12
15
18
21
24
TIME (HOURS I.S.T.)
RESEARCH AIR DEPARTMENT

FIG. 3

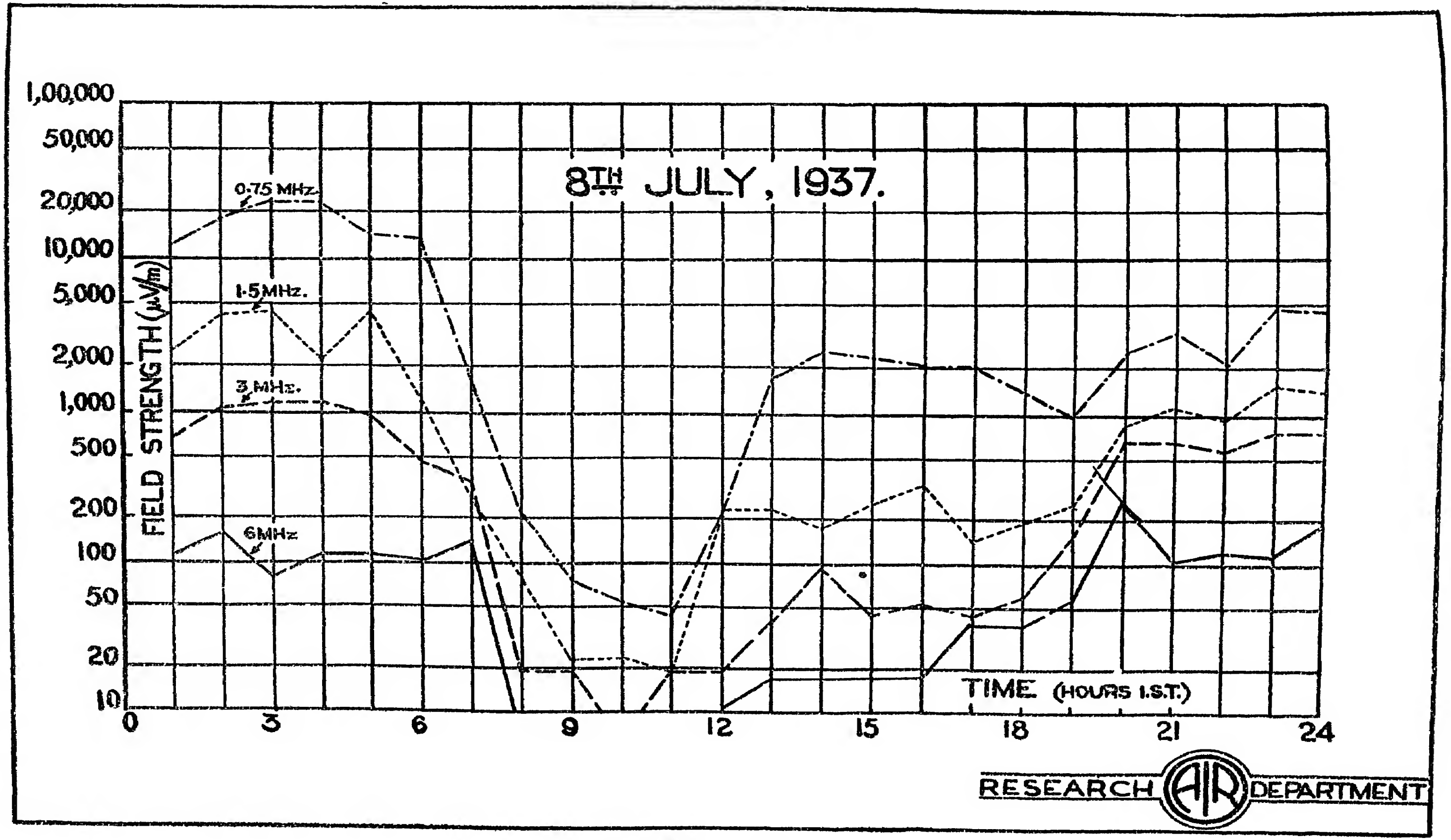
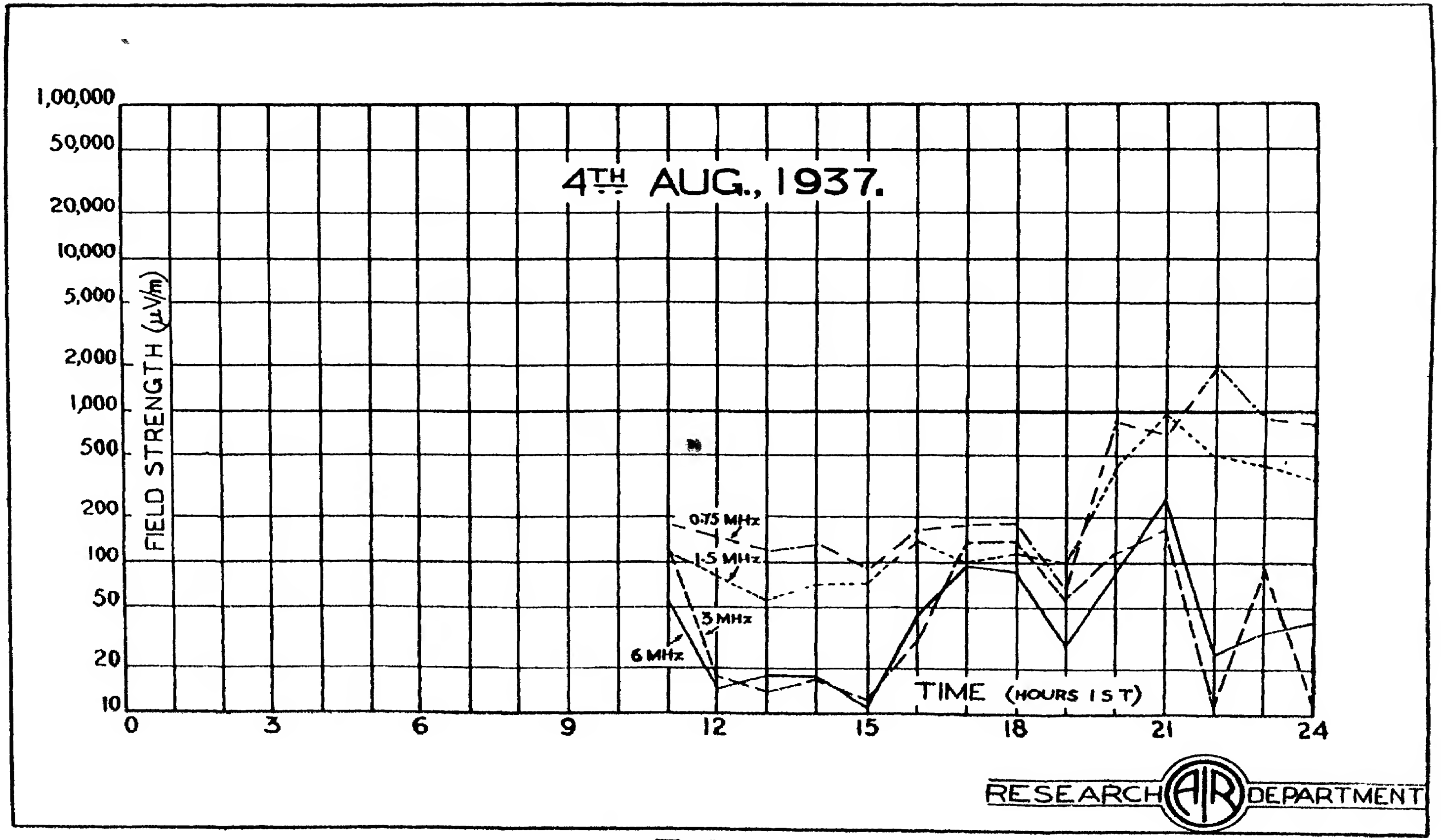

8TH JULY, 1937.
FIELD STRENGTH (μV/m)
1,00,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
0.75 MHz.
1·5MHz.
3 MHz.
6MHz
0
3
6
9
12
15
18
21
24
TIME (HOURS I.S.T.)
RESEARCH DEPARTMENT

FIG.4



4TH AUG., 1937.
FIELD STRENGTH (μV/m)
1,00,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
0
3
6
9
12
15
18
21
24
TIME (HOURS I S T)
0.75 MHz
1.5 MHz
3 MHz
6 MHz
RESEARCH AIR DEPARTMENT

FIG.5

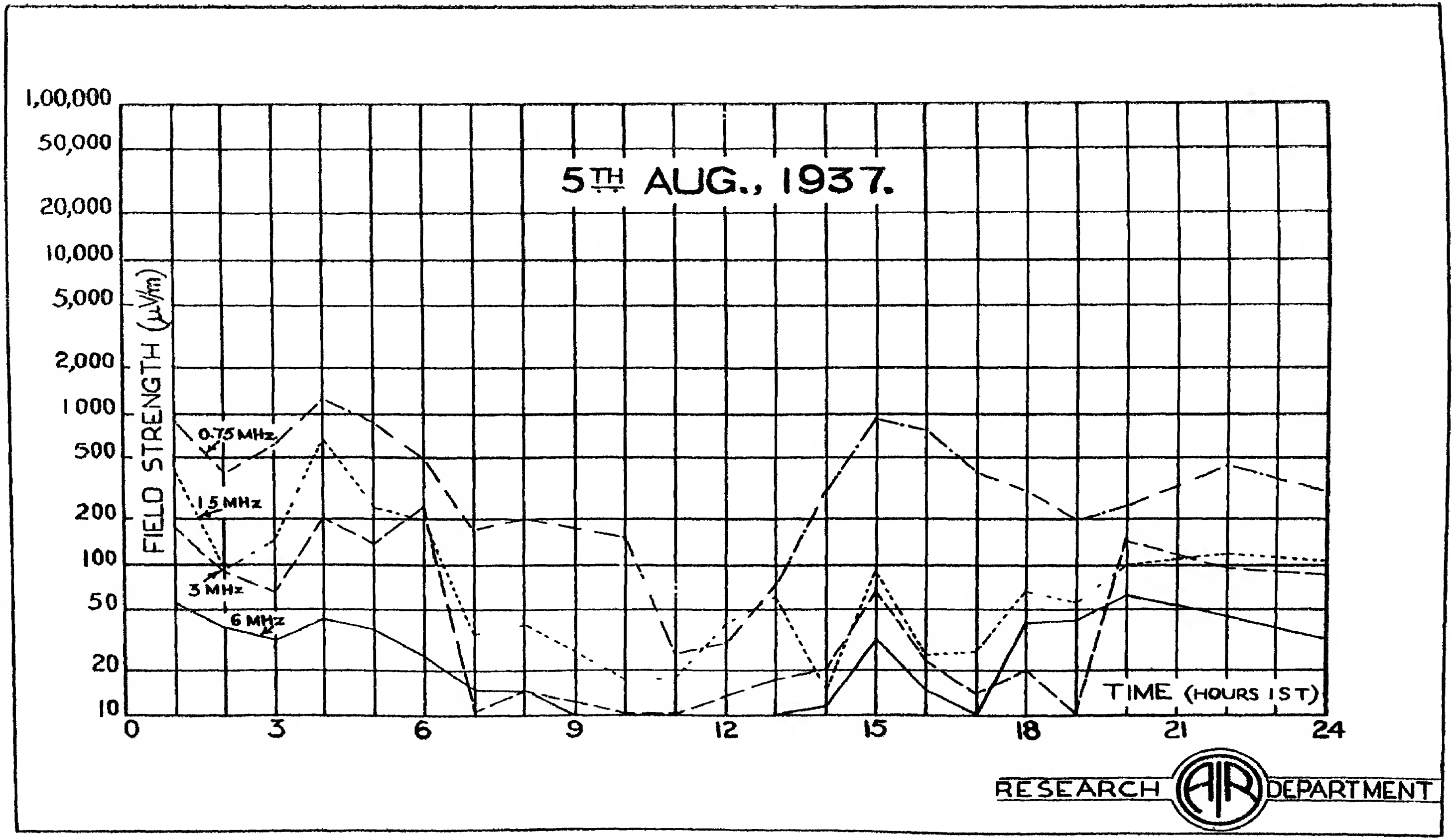

5TH AUG., 1937.
FIELD STRENGTH (µV/m)
1,00,000
50,000
20,000
10,000
5,000
2,000
1000
500
200
100
50
20
10
0.75 MHz
1.5 MHz
3 MHz
6 MHz
0
3
6
9
12
15
18
21
24
TIME (HOURS IST)
RESEARCH
AIR
DEPARTMENT

FIG.6

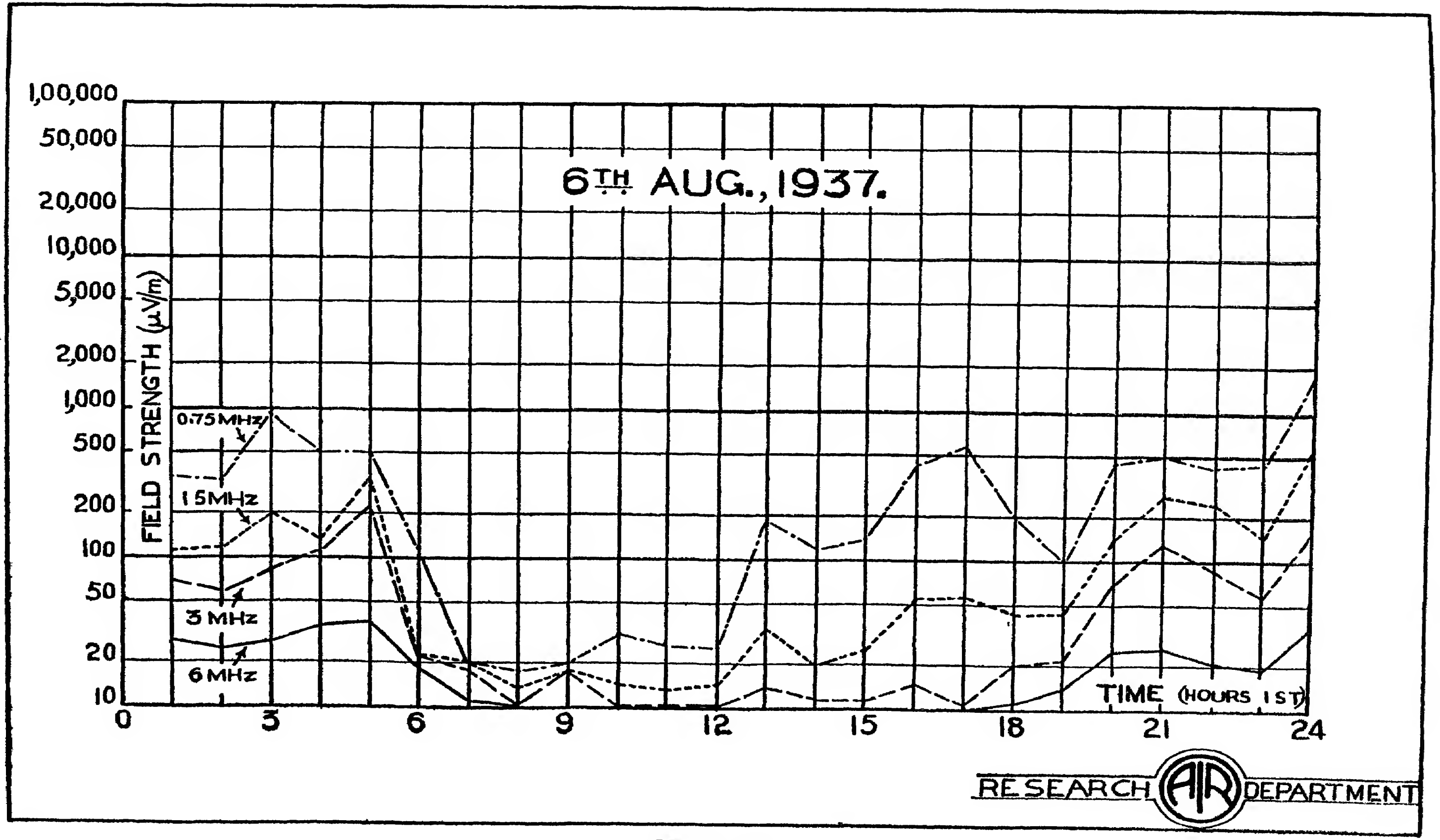

6TH AUG., 1937.
FIELD STRENGTH (µV/m)
1,00,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
0.75 MHz
1.5 MHz
3 MHz
6 MHz
0
3
6
9
12
15
18
21
24
TIME (HOURS I ST)
RESEARCH AIR DEPARTMENT

FIG.7

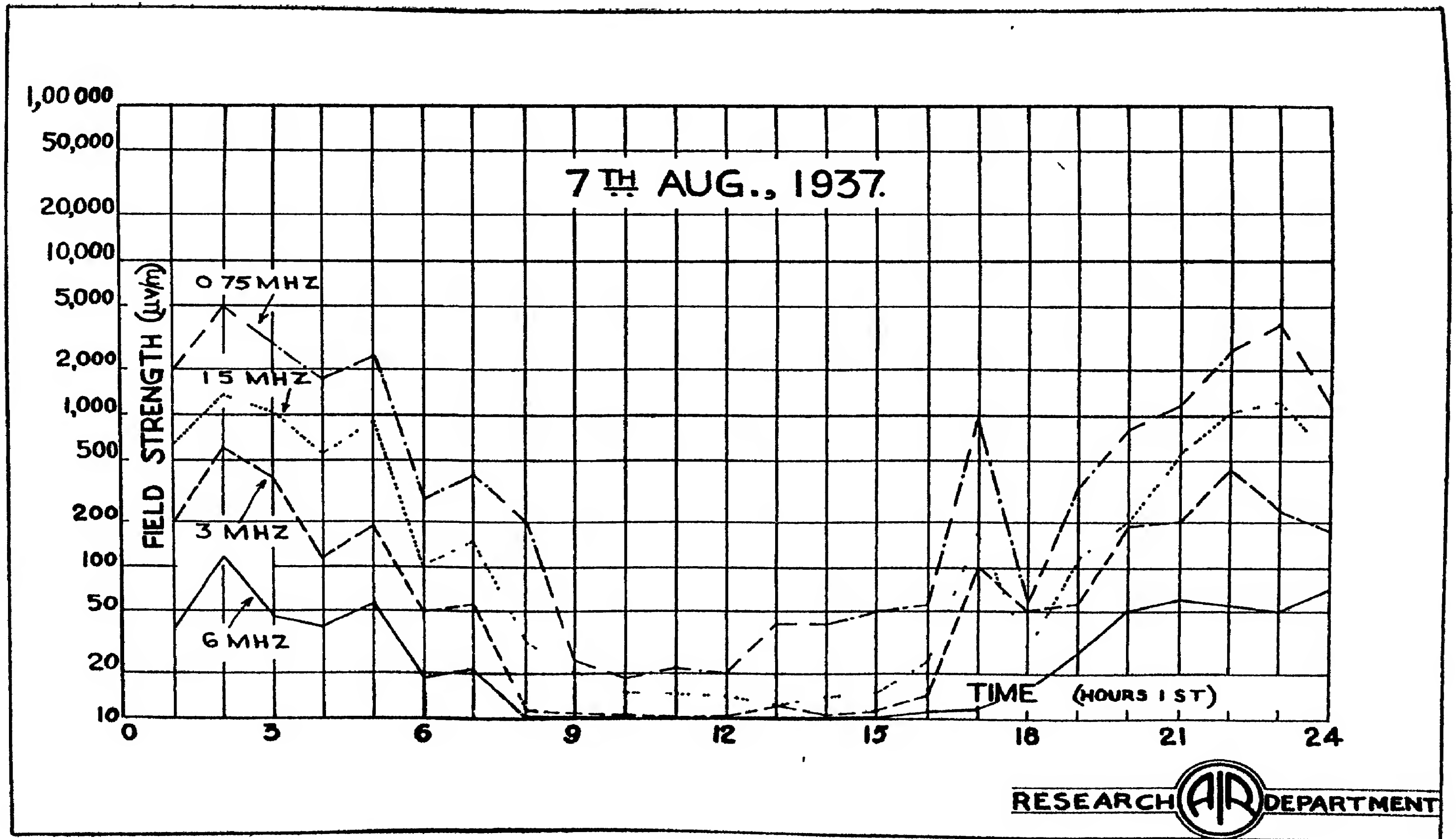
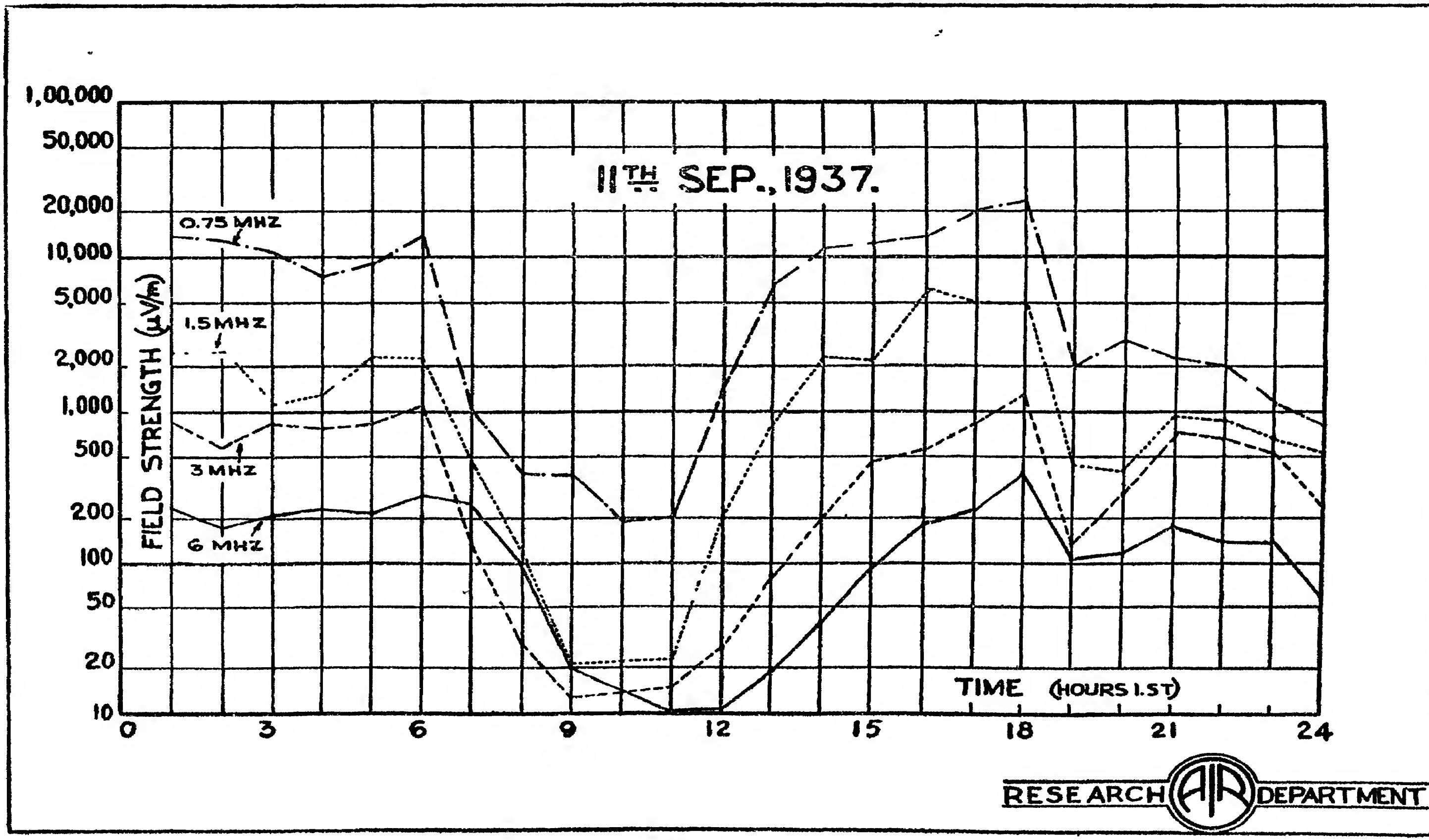

7TH AUG., 1937.
FIELD STRENGTH (μV/m)
1,00 000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
0 75 MHZ
1 5 MHZ
3 MHZ
6 MHZ
0
3
6
9
12
15
18
21
24
TIME (HOURS I ST)
RESEARCH AIR DEPARTMENT

FIG.8



11TH SEP., 1937.
FIELD STRENGTH (µV/m)
1,00,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
0.75 MHZ
1.5 MHZ
3 MHZ
6 MHZ
0
3
6
9
12
15
18
21
24
TIME (HOURS I.S.T)
RESEARCH DEPARTMENT

FIG. 9

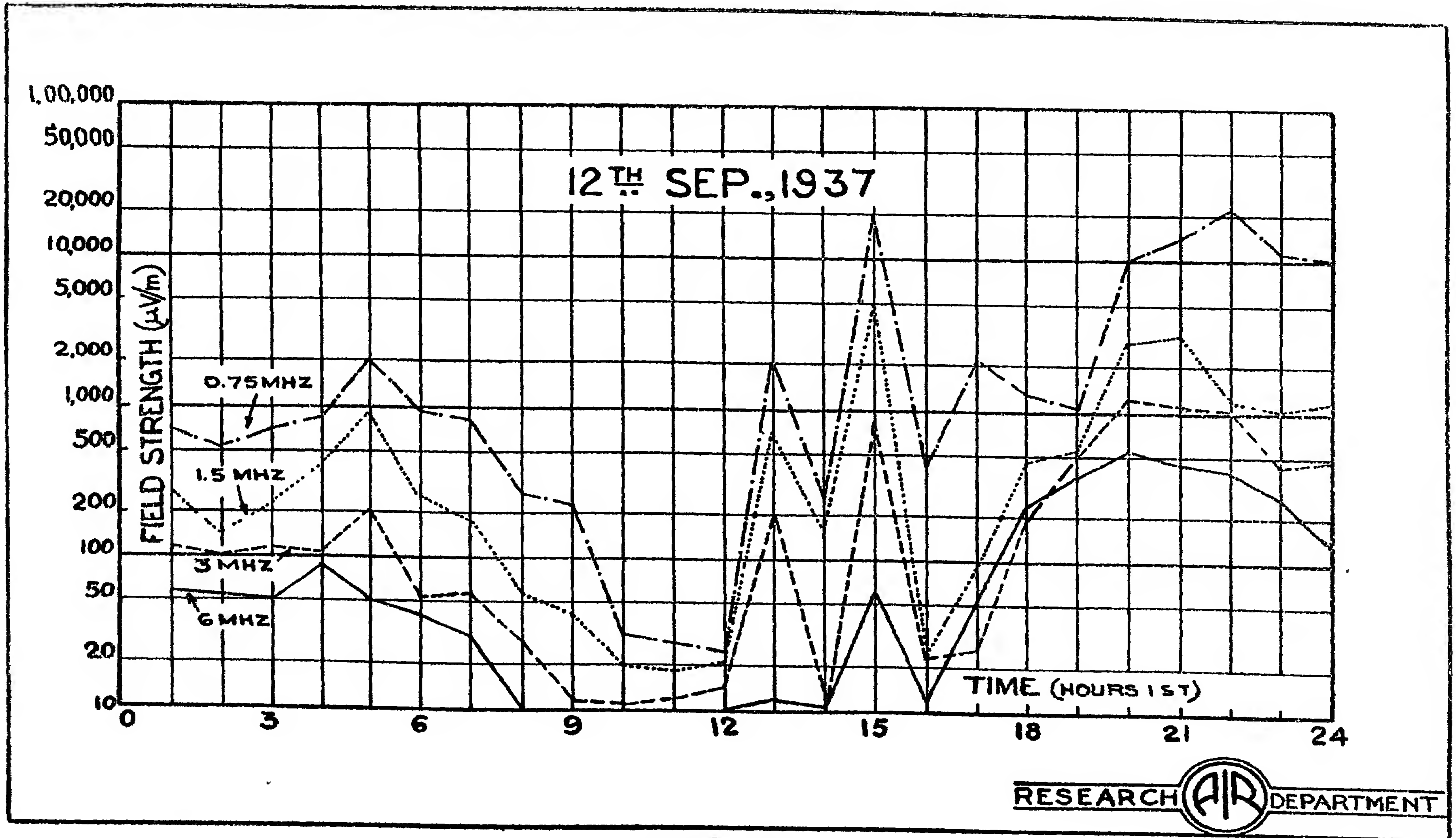

12TH SEP., 1937
1,00,000
50,000
20,000
10,000
5,000
2,000
1,000
500
200
100
50
20
10
FIELD STRENGTH (μV/m)
0.75 MHZ
1.5 MHZ
3 MHZ
6 MHZ
0
3
6
9
12
15
18
21
24
TIME (HOURS I S T)
RESEARCH AIR DEPARTMENT

FIG.10

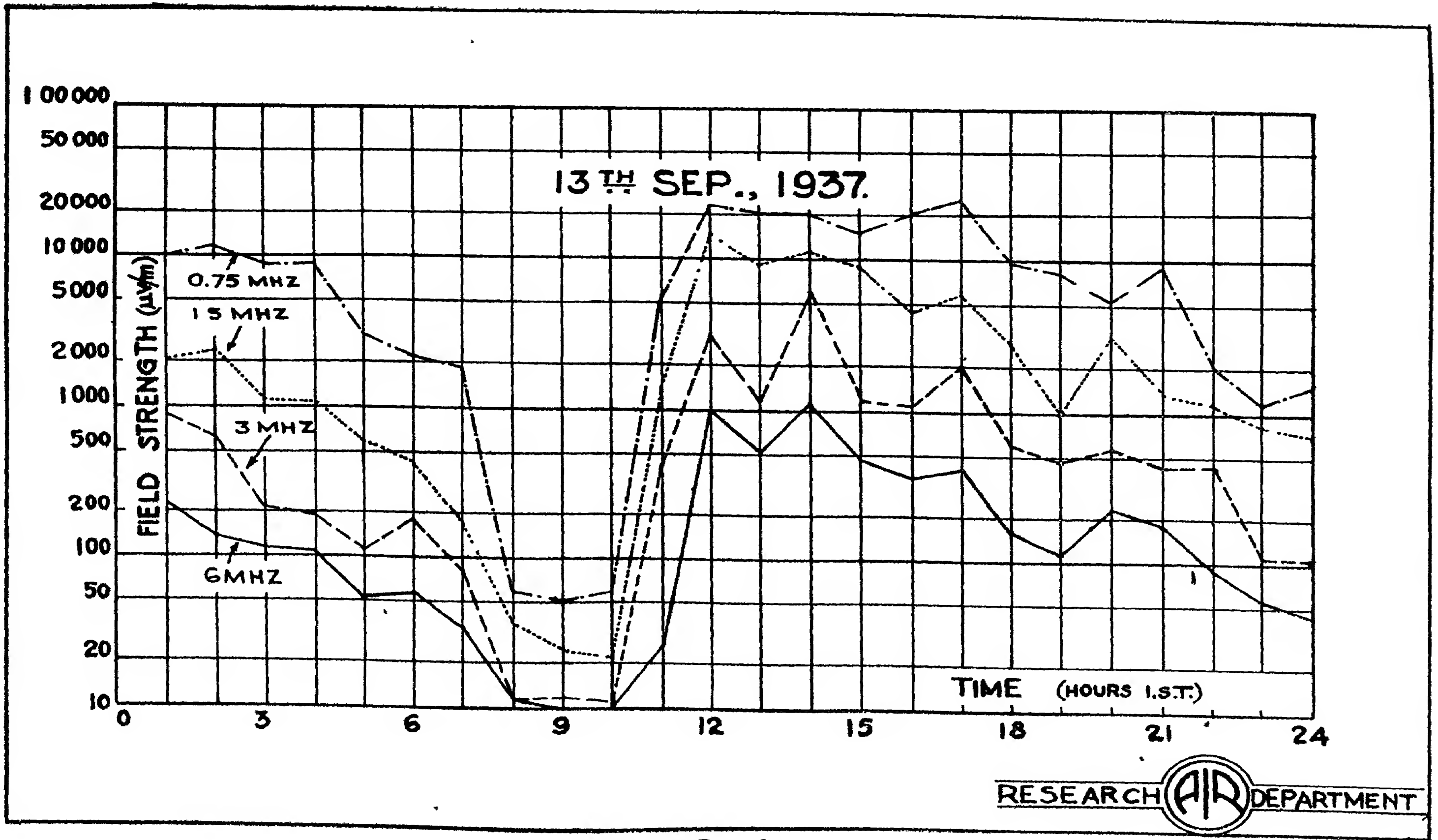

13TH SEP., 1937.
FIELD STRENGTH (µV/m)
1 00 000
50 000
20000
10 000
5000
2000
1000
500
200
100
50
20
10
0.75 MHZ
1.5 MHZ
3 MHZ
6 MHZ
TIME (HOURS I.S.T.)
0
3
6
9
12
15
18
21
24
RESEARCH AIR DEPARTMENT

FIG. 11

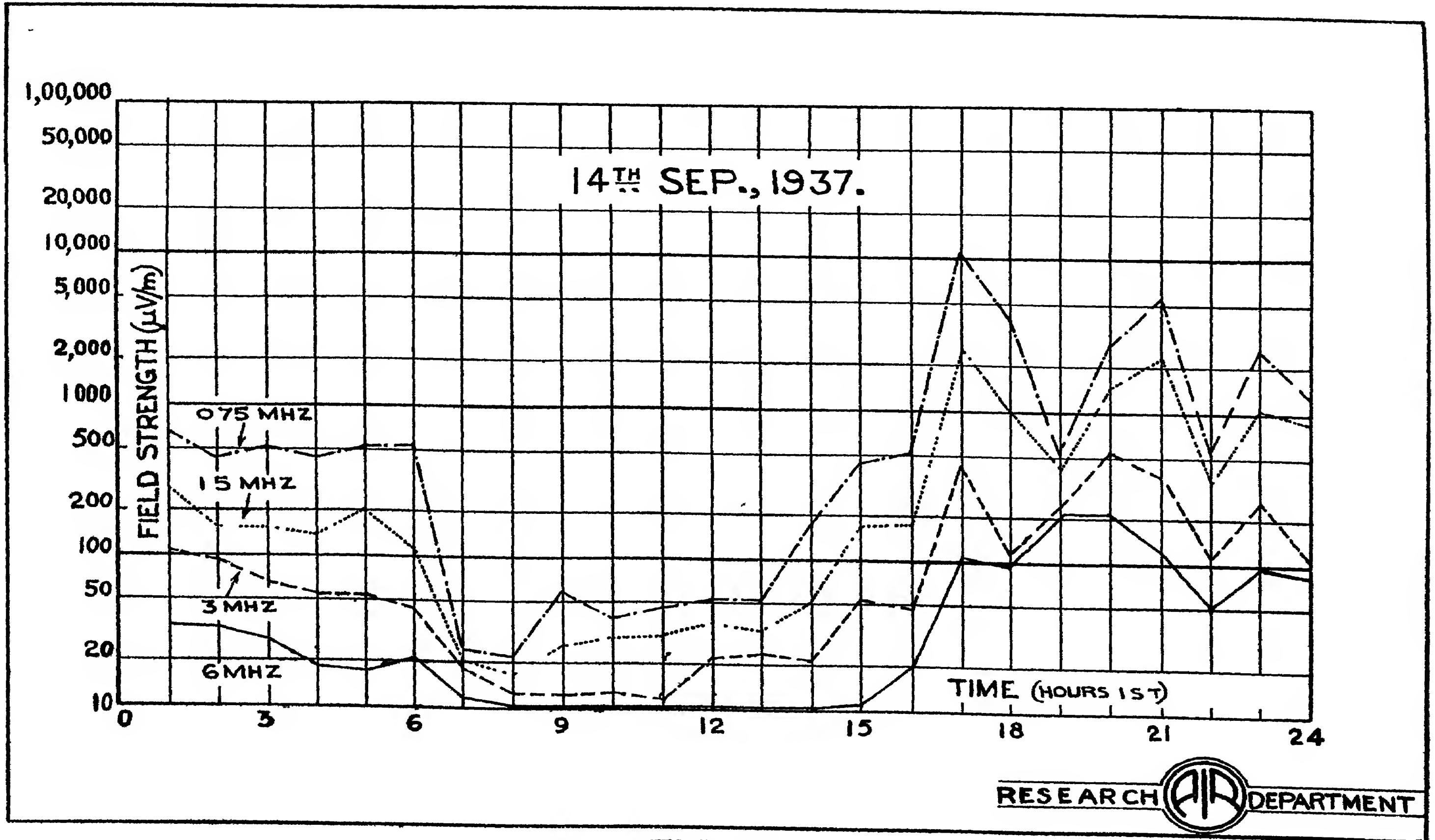

14TH SEP., 1937.
FIELD STRENGTH (µV/m)
1,00,000
50,000
20,000
10,000
5,000
2,000
1000
500
200
100
50
20
10
0·75 MHZ
1·5 MHZ
3 MHZ
6 MHZ
0
3
6
9
12
15
18
21
24
TIME (HOURS IST)
RESEARCH AIR DEPARTMENT

FIG.12

SECTION 5.

Technical Description of the Lahore Broadcasting Centre.

235. The Lahore Station was the first of the new mediumwave broadcasting centres to be established under the development programme of All India Radio. It may be taken as a prototype of the 5 K.W. mediumwave broadcasting centres which are being established by All India Radio.

236 This report deals with the establishment of the Lahore centre.

(i) Choice of Site.

237. The first stage in the establishment of a new broadcasting centre is the choice of site for the transmitting station. The site must be so located that a satisfactory service is given to the town which the station is primarily intended to serve ; the conductivity of the soil on the site chosen should be satisfactory from the electrical point of view ; the site should be so chosen that, if possible, any other towns near the station are also served ; suitable roads should be available up to the site for the transport of heavy materials ; the site must be so located that electric power supply may be made available without excessive cost.

238. The distance at which the site is located from the city is determined by the strength of signal required. With a station of 5 K.W. power the distance is of the order of 9 to 10 miles and does not vary appreciably with the range of ground conductivities met with in practice. It therefore became necessary to find a site within a radius of 9 to 10 miles from Lahore city. Owing to the proximity of Amritsar it was evidently desirable to locate the site between Lahore and Amritsar in order that the city of Amritsar might obtain the best possible service. The site eventually chosen is located as shown in Fig. 1 and is ten miles two furlongs from Lahore on the Lahore-Amritsar Grand Trunk Road. The site area is approximately five acres. The layout of the site is shown in Fig. 2.

(ii) Power Supply.

239. Power supply is obtained from the Punjab Public Works Department Electricity Branch from the Hydro-Electric Sub-station which is located at the third mile on the Lahore-Amritsar Road or seven miles distant from the transmitting site. A three phase 3,000 volt overhead line was already in existence up to the fifth mile on the Lahore-Amritsar Road, and this line was extended by the Punjab P. W. D. to the transmitting site (see Fig. 1).

240. A pole mounted out-door sub-station is provided in front of the transmitting station, and from this structure a three phase 400 volt underground cable is taken into the transmitting station building. Power supply is obtained on the industrial tariff on the following basis :—

Maximum KVA demand charges ..	Rs. 7 per KVA.
Unit charges	0·45 annas/unit.
Average annual consumption for 8 hours	

241. While from the point of view of reliability electric supply by underground cable is preferred for broadcasting stations, the higher capital cost must be taken into consideration, and the choice between overhead supply and underground cable considered on its merits in each case. At Lahore an overhead line up to half the distance to the site was already in existence and in view of the proximity of the sub-station and the ease with which maintenance could be carried out it was considered that the additional cost of an underground cable was not justified.

(iii) Telephone Lines.

242. Special telephone circuits are required from the studio building to the transmitting station site along which the programmes originating in the studios are conveyed to the transmitting equipment In the case of Lahore two special non-exchange lines and one exchange line have been provided by the Posts and Telegraphs Department One of the non-exchange lines is normally used for the programmes, and the second is provided as a spare to be used in case of breakdown of the normal pair. The spare line is in practice used for communication between the control room staff in the studio building and the transmitting station staff.

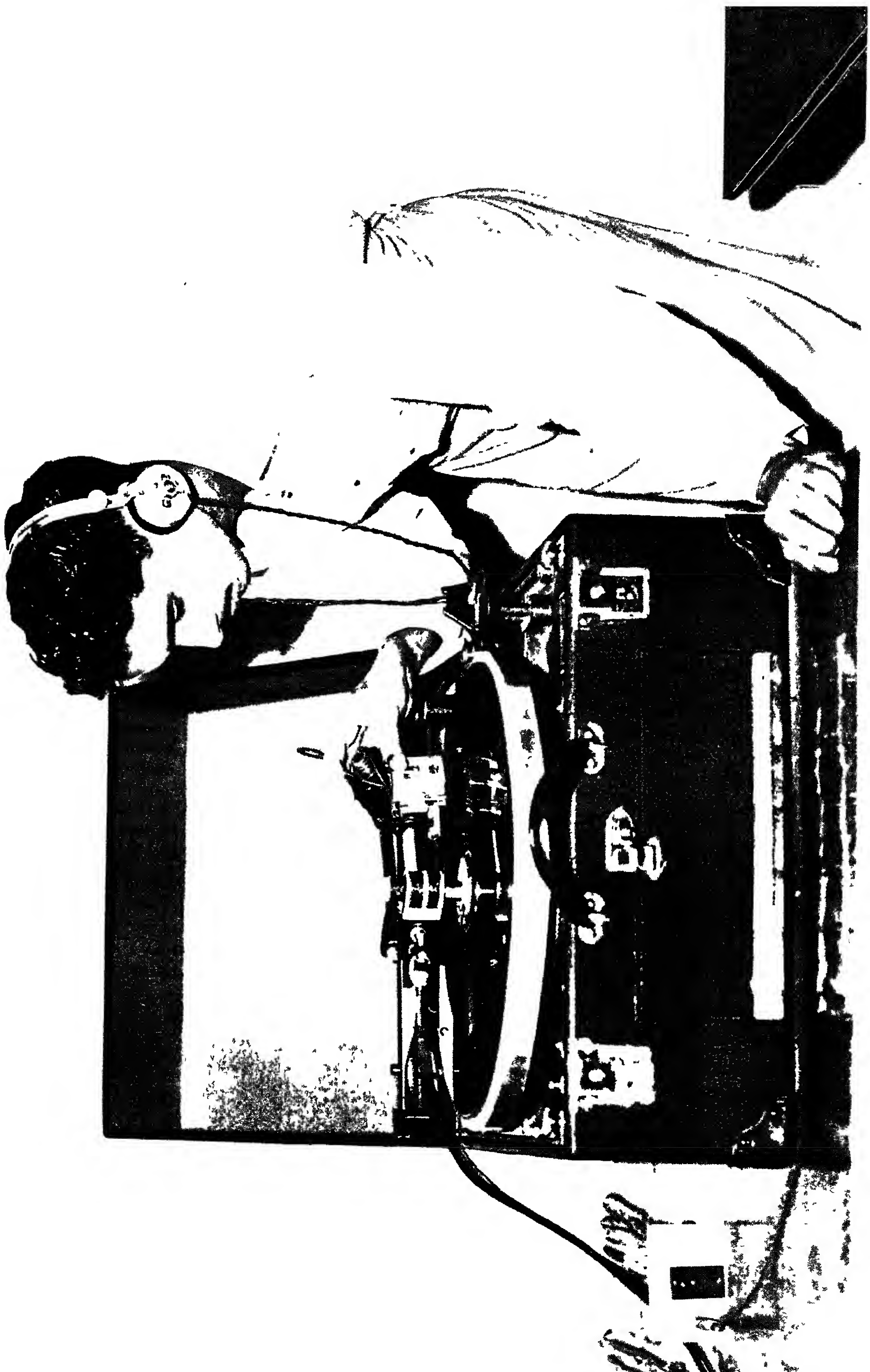
243. The telephone circuits at Lahore have been run on a special pole line along the route shown in Fig. 1. The two non-exchange pairs are 200 lb. copper for the greater part of the run. The frequency attenuation characteristic of the line is corrected by means of an equalizer at the transmitting station to give a sensibly linear overall frequency response characteristic.

(iv) Transmitting Station Building.

244 The transmitting station building was constructed by the Central Public Works Department to a floor plan layout provided by the Installation Department, All India Radio. The floor plan of the building is shown in Fig. 3.

245 The transmitting equipment proper is located in the area marked ' Transmitter Enclosure ' and the front panels of the transmitting equipment fit into the opening facing the ' Transmitter Hall ' as shown. The wall above the transmitting panel extends up to the ceiling so that with the transmitter in place the ' Transmitter Hall ' is isolated from the ' Transmitter Enclosure ' to which access can only be obtained through the doors on either side of the ' Transmitter Hall '. This form of construction has been employed to prevent the heat which is generated in the Transmitter Enclosure from reaching the ' Transmitter Hall '. The considerable amount of heat generated by the transmitting equipment in the enclosure is removed from the enclosure by exhaust fans located above the two side doors.

246. A local studio is provided which can be used in the case of an emergency, such as a serious breakdown on the telephone line connections from the main studio building to the transmitting station. Microphone equipment and gramophone reproducers are provided in the local studio. The other rooms provided are the Station Engineer's office, workshop, valve stores, where the spare valves for the transmitter are stored, and the cloak room.



247. This floor plan layout has been adopted as the standard layout for the new broadcasting centres employing 5 kilowatt mediumwave transmitters and the buildings at Lucknow, Trichinopoly and Dacca are constructed to the same plan. The adoption of a standard form of building has resulted in a considerable amount of saving on the other stations as it has been possible to use the Lahore plans and estimates at Lucknow, Trichinopoly and Dacca as a basis for the preparation of plans and estimates for these stations.

248. A garage and chowkidar's quarters are also located on the transmitting station site.

(v) Studio Building.

249. The policy of All India Radio at the present time in the case of broadcasting studios is to rent existing buildings suitable for studio purposes rather than to build specially.

250. The principal requirements of a building to be suitable for studio purposes are that it shall be located in a suitable and accessible part of the town and with five or six rooms available of the dimensions required for studio purposes. The shape and construction of rooms and height of ceiling must be considered from the point of view of the resultant acoustic properties from the rooms when treated. In addition sufficient accommodation must be available for the Station Director, Station Engineer and the Programme, Technical and Office staff. The building requires to be located in a relatively quiet area in order that noises shall not enter the studios and disturb the programmes. For this purpose a building is usually chosen with a large compound.

251. The floor plan layout of the studio building chosen at 39, Empress Road, Lahore, is shown in fig 4 Five studios are provided, for European Music, Indian Music, Drama, Talks and Recorded Programmes, as shown. Each of these rooms is treated acoustically and decorated in a different manner. Technical information on the acoustic treatment of the rooms is given in Section 7. All studios are connected with the Control Room where the speech input and control equipment is located.

(vi) Control Room Equipment.

252. Facilities are provided in the Control Room for receiving the programme from any of the five studios and amplifying it to a suitable extent before it is transmitted along the telephone lines to the transmitting station. In addition to the control on the microphones in each studio a signalling system is also provided between the Control room and each studio which is used by the Control Room to inform any studio when the programme is to start and the studio can also signal to the Control Room when the programme is finished. The signalling is carried out by a method of red and green lights. When a microphone in any studio is energised, a red warning light is illuminated both on the inside and outside of the studio doors. An internal telephone system is also provided from several points in the corridor to the Control Room so that continuous contact can be maintained between the Control Room and the studios.

253. It will be seen from fig. 4 that listening rooms are also provided. Loudspeakers are provided in these rooms as well as in all studios and in some of the offices, so that the programme and technical staff can listen to the programme which is being transmitted.

254. The speech input equipment for controlling the output from the microphones in the various studios is capable of handling simultaneously a normal programme transmission in one studio and a rehearsal in a second studio. Either the programme or the rehearsal may be listened to from the loudspeakers in the studios not in use, or in the listening rooms. During the hours in which programme is not being radiated, two rehearsals can be conducted simultaneously. Similar facilities are provided on all the 5 K.W. mediumwave broadcasting centres. Additional facilities are provided on the centres with two transmitters where alternative programmes and rehearsals take place at the same time.

255. The speech input equipment is operated from a 220 volt single phase alternating current supply and no batteries are required. The equipment comprises six pre-amplifiers, with a gain of approximately 60 DB each Each of five of these pre-amplifiers is associated with a microphone in one of the studios. The sixth pre-amplifier is maintained as a spare. The output of the six pre-amplifiers is led to a control unit located on the operator's control table where the output of the six pre-amplifiers may be adjusted on variable attenuators. The pre-amplifiers are followed by three main amplifiers having a gain of 85 DB. One of these amplifiers is the normal programme amplifier, the second is available for the rehearsal channel and the third is used for operating loudspeakers from the programme amplifier. In addition a loudspeaker switching panel is available for switching the loudspeakers in the studios not in use to either the programme or the rehearsal room channel, and two variable line equalizers for use with outside broadcast lines. An amplifier selector switch is provided on the control room unit so that in the event of the failure of the main programme amplifier the second or rehearsal amplifier can be switched instantaneously into circuit. A high speed level indicator is provided on the control table which is used for adjusting the level of the programme sent to the transmitting station. A second variable power level indicator is also mounted on the main speech input rack capable of measuring from minus 10 to plus 30 DB. Fig. 5 shows the various stages through which the speech or music from the studios passes before it is ultimately radiated from the aerial of the transmitting station.

(vii) Capital Cost of a 5 Kilowatt Mediumwave Broadcasting Centre.

256. The capital cost for the establishment of a 5 K.W. mediumwave broadcasting centre is shown in Table 1. This refers to the Lahore Station and similar figures apply to the stations at Lucknow, Trichinopoly and Dacca.

(viii) Recurring Expenditure (Technical) for a 5 Kilowatt Mediumwave Broadcasting Centre.

257. The recurring costs comprise essentially the cost of power supply, replacement of valves and general technical maintenance. The annual

recurring expenditure (technical) for operating a 5 K.W. mediumwave station is given in Table 2.

TABLE 1.

Capital Cost of a 5 K.W. M.W. Broadcasting Centre.

Description.	Estimated Cost. Rs.	Rs
A.—WORKS—		
1. Transmitter Site	1,695	
2. Transmitter Building	22,452	
3. Trench Covers	135	
4. Exhaust Fans	718	
5. Studio Modifications, etc.	4,900	29,900
B.—EQUIPMENT—		
1. Transmitter Plant, etc.	91,240	
2. Studio Equipment	22,000	
3. Local Studio Equipment	3,065	
4. O. B. Equipment	3,250	
5. I. S. D. Charges	2,391	
6. Erection and Supervision	7,500	
7. Power Supply Equipment	6,295	
8. Acoustic Treatment	5,480	
9. Musical Instruments	7,000	
10. Furniture	4,500	
11. Motor Conveyance	7,000	
12. Contingencies	3,970	1,63,700
TOTAL		1,93,600

TABLE 2.

Annual Recurring Expenditure (Technical) for a 5 K.W. M.W. Broadcasting Centre.

Particulars.	Estimated Expenditure. Rs.	Rs.
I.—TRANSMITTER—		
1. Transmitting Valves—1 set	9,250	
2. Spares for Transmitter Plant	2,000	
3. Cables, etc.	150	
4. Repairs to Machineries, etc.	300	
5. Tools	250	11,950
II.—STUDIOS—		
1. Valves—5 sets	750	
2. Spares for Studio Equipment	1,500	
3. Cables, Flexibles, etc.	200	
4. Tools	50	2,500
III.—POWER SUPPLY CHARGES	9,000	9,000
IV.—CONTINGENCIES	1,000	1,000
TOTAL		24,450

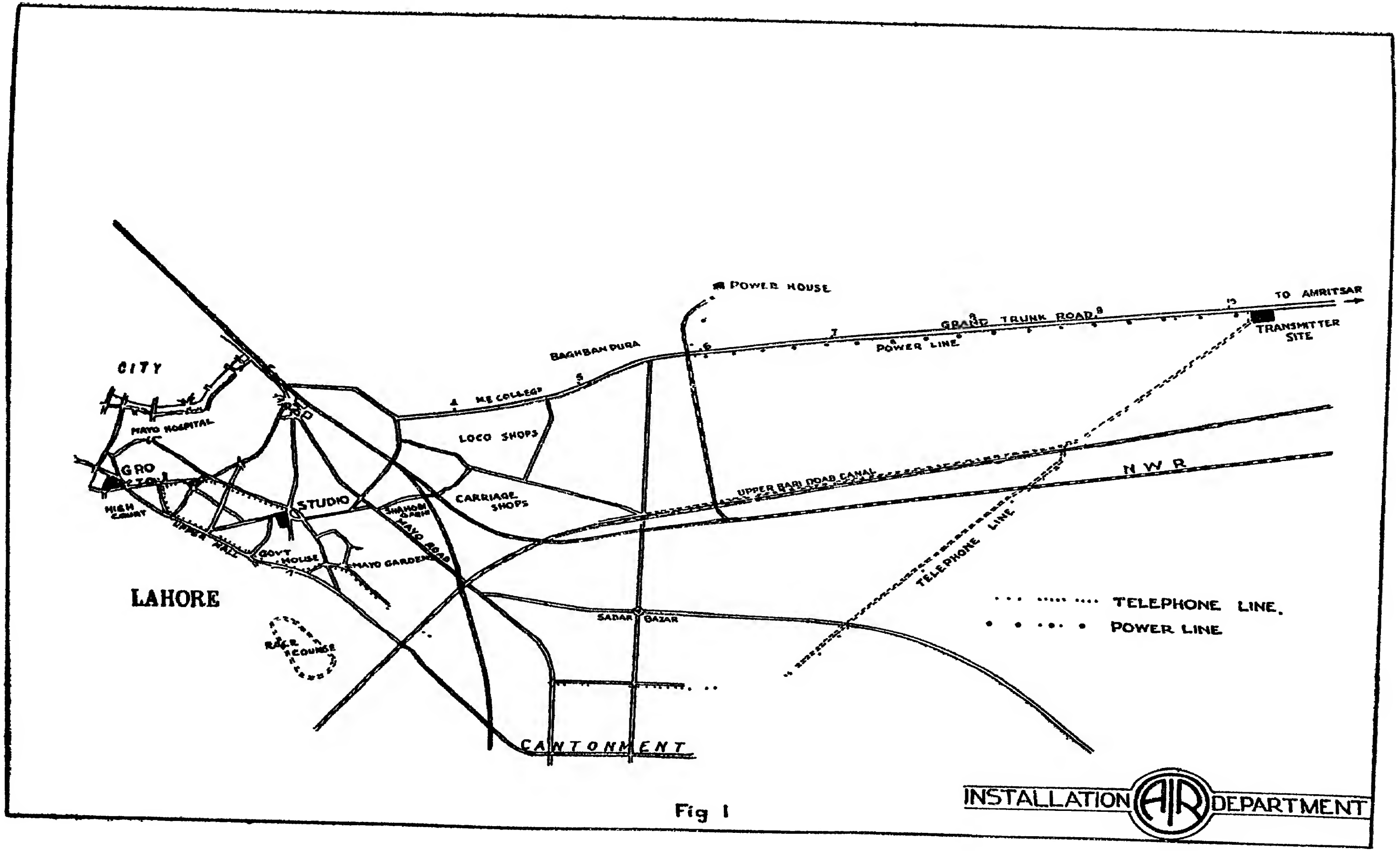

TO AMRITSAR
TRANSMITTER SITE
GRAND TRUNK ROAD
POWER LINE
POWER HOUSE
BAGHBANPURA
M.E. COLLEGE
LOCO SHOPS
CARRIAGE SHOPS
UPPER BARI DOAB CANAL
N W R
TELEPHONE LINE
CITY
MAYO HOSPITAL
GRO
HIGH COURT
STUDIO
UPPER MALL
GOVT HOUSE
MAYO GARDENS
MAYO ROAD
LAHORE
RACE COURSE
SADAR BAZAR
CANTONMENT
TELEPHONE LINE.
POWER LINE
INSTALLATION
AIR
DEPARTMENT

Fig 1

AERIAL, EARTH & FEEDER SYSTEM FOR MEDIUM-WAVE TRANSMITTING STATIONS

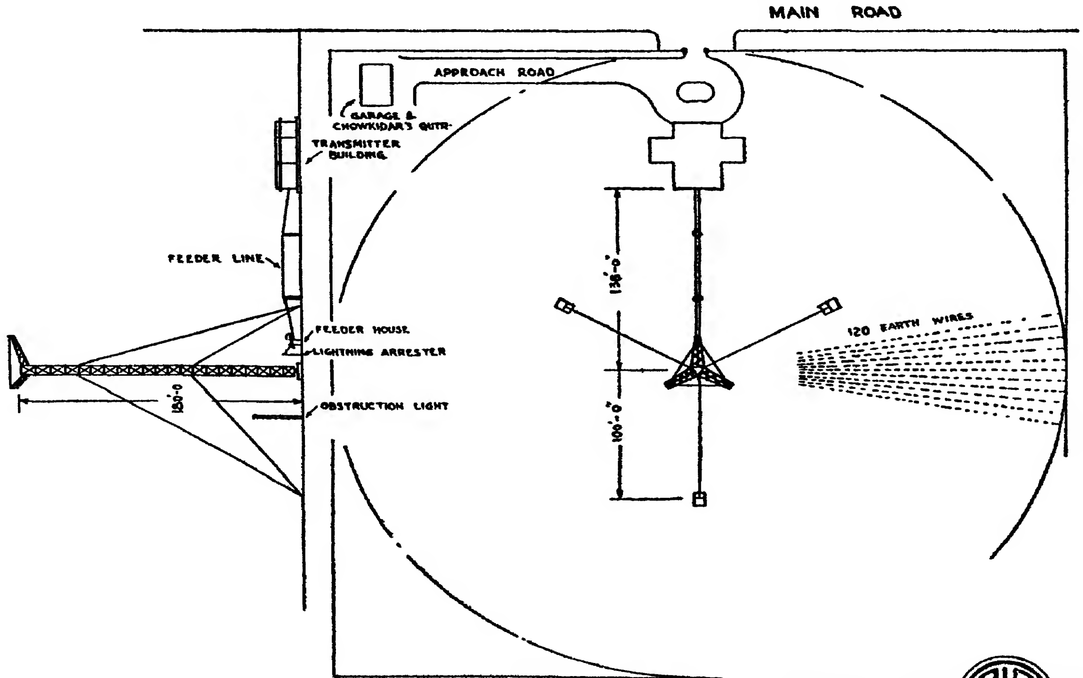


Fig. 2

INSTALLATION AIR DEPARTMENT

FLOOR PLAN
MEDIUM-WAVE TRANSMITTING STATION

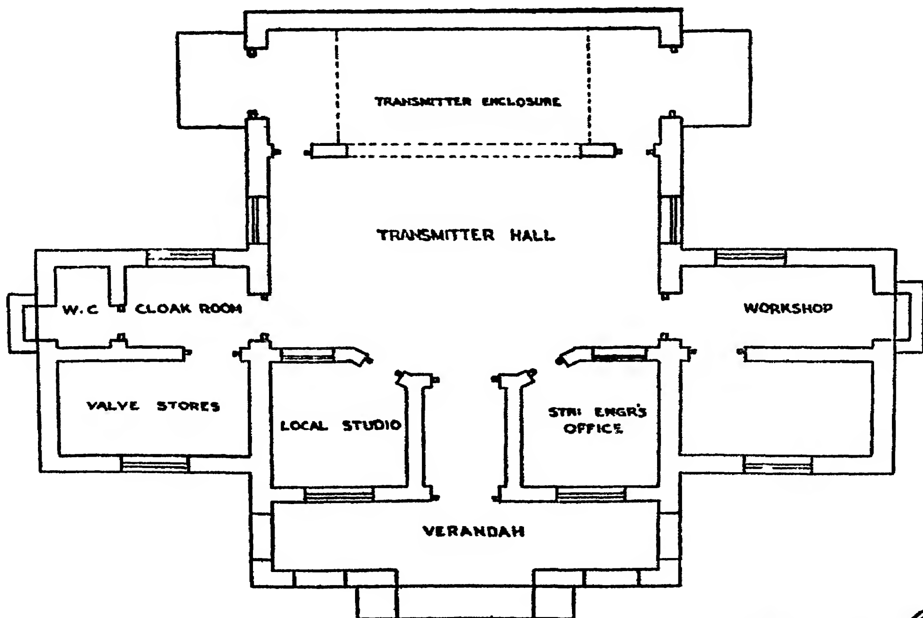
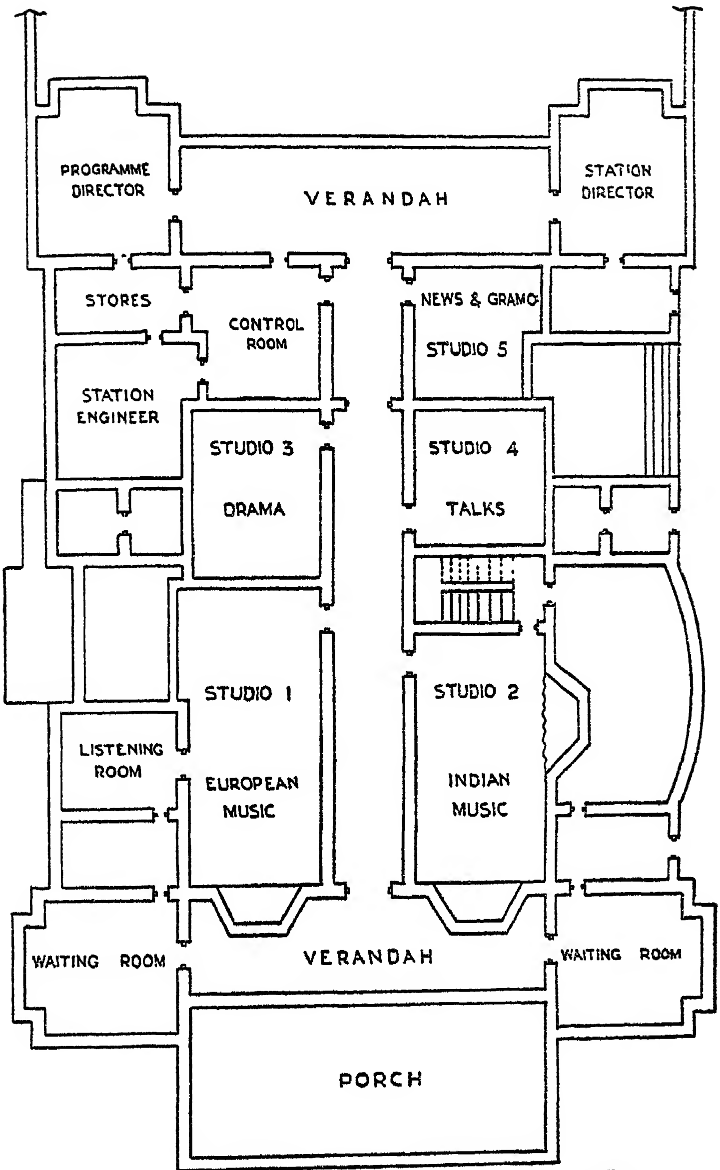


Fig. 3

INSTALLATION AIR DEPARTMENT

FLOOR PLAN
STUDIO BUILDING LAHORE



INSTALLATION AIR DEPARTMENT

Fig 4

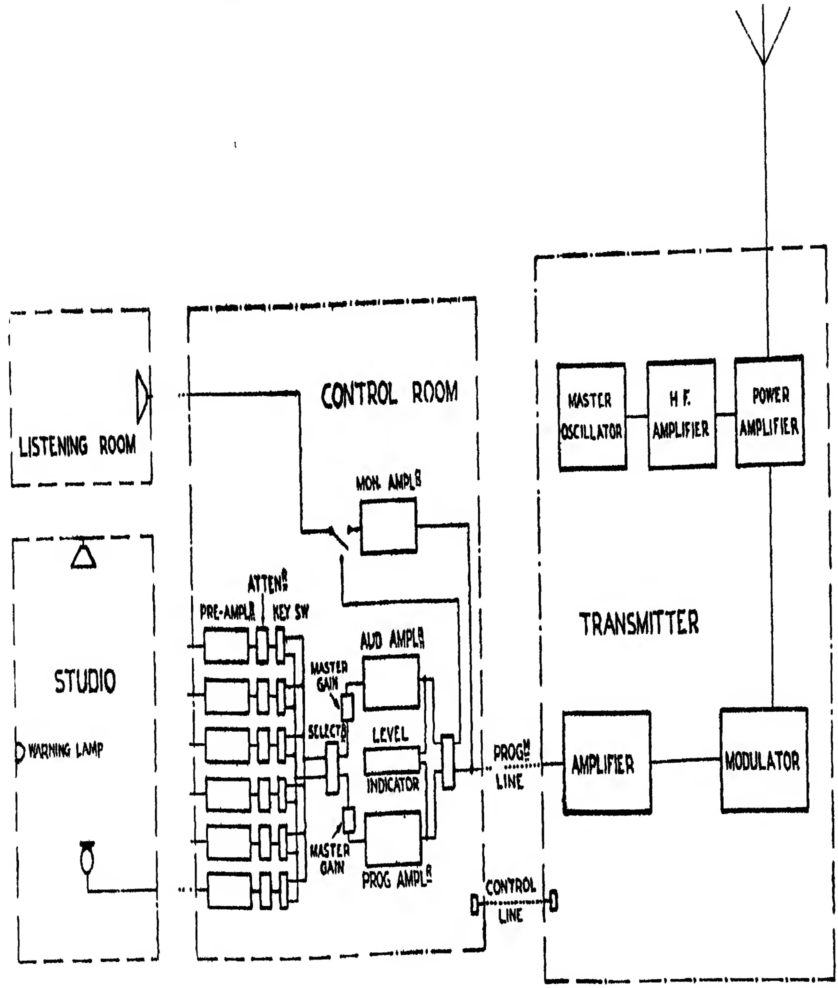


Fig. 5

INSTALLATION AIR DEPARTMENT

SECTION 6.

Technical Description of the New AIR Transmitting Equipment.

258. In accordance with the policy formed for the establishment of a Broadcasting scheme in India, ten transmitting equipments have been ordered Four shortwave key stations are located at Delhi, Bombay, Calcutta and Madras, and are of 10 K.W. aerial power. A second shortwave transmitter of 5 K.W. is also provided at Delhi for special purposes. The remaining five transmitting equipments are for the five mediumwave stations located at Lahore, Lucknow, Trichinopoly, Dacca and Madras The first four stations have a power of 5 K.W The Madras mediumwave station has a power of 250 watts and gives service to the city only. A technical description of these new AIR Transmitting stations is given in this report.

259. The transmitters provide full facilities for operation, maintenance and safeguarding the life of the operating personnel. All the doors on the panels are provided with electrical contacts In the event of opening any of the doors the power is cut off automatically by operating on the respective switches, making all parts electrically dead till such time as the door is closed. Further protection to the equipment is provided by a series of electrical interlocks which require that the operator start or shut down the transmitter in a particular sequence (Fig 1). If any other mode of switching is adopted, the transmitter will not come into operation thus preventing any damage to the equipment otherwise caused by inexperience or negligence.

260. With the improvements in the design of modern transmitters an improvement in overall efficiency has been obtained. The efficiency of a transmitter chiefly 'determines the consumption of electric power and therefore contributes in keeping down the recurring costs of a station. Table 3 shows the power consumption and overall efficiency of each type of transmitter installed in India.

(i) The 10 K.W. Shortwave Transmitter.

261. The transmitter comprising an A. C. Switch Board, a high frequency panel, and a high voltage rectifier and modulater panel, is installed with the panels symmetrically placed in the main transmitter hall, while the control table at the centre gives a good view of all meters and components mounted on these panels. On the other hand, all the rotating machinery, consisting of duplicate filament converter sets for supply of filament currents to the various transmitter valves, motor-driven water pumps and ventilating fan required for the circulation and cooling of the water in the high power stages are mounted on concrete foundations in the Machine Room adjacent to the Transmitter Hall. Besides, a high tension enclosure is also provided in this room for accommodating the high tension and modulation transformers and the necessary rectifier smoothing condensers and chokes. Interconnection between the transmitter panels and the various machines, transformers and safety panels is carried out by suitable screened cables laid in trenches made in the flooring of the building. The layout of the equipment (Fig. 2) thus presents a neat appearance as a whole.

262. The entire transmitter, delivering 10 K.W. of unmodulated carrier power to the aerial, works at a common 400 volts, 3 phase, 50 cycles A. C. supply and consumes 52 K.W of electric energy from the supply mains. The 400 volts supply mains is terminated at the A. C. Switch Board from which it is distributed through various switches and protective fuses to the converters, transformers, etc., used for conversion to D. C. tensions required for the filament, grid and plate supplies of the valves.

(ii) Master Oscillator and High Frequency Stages.

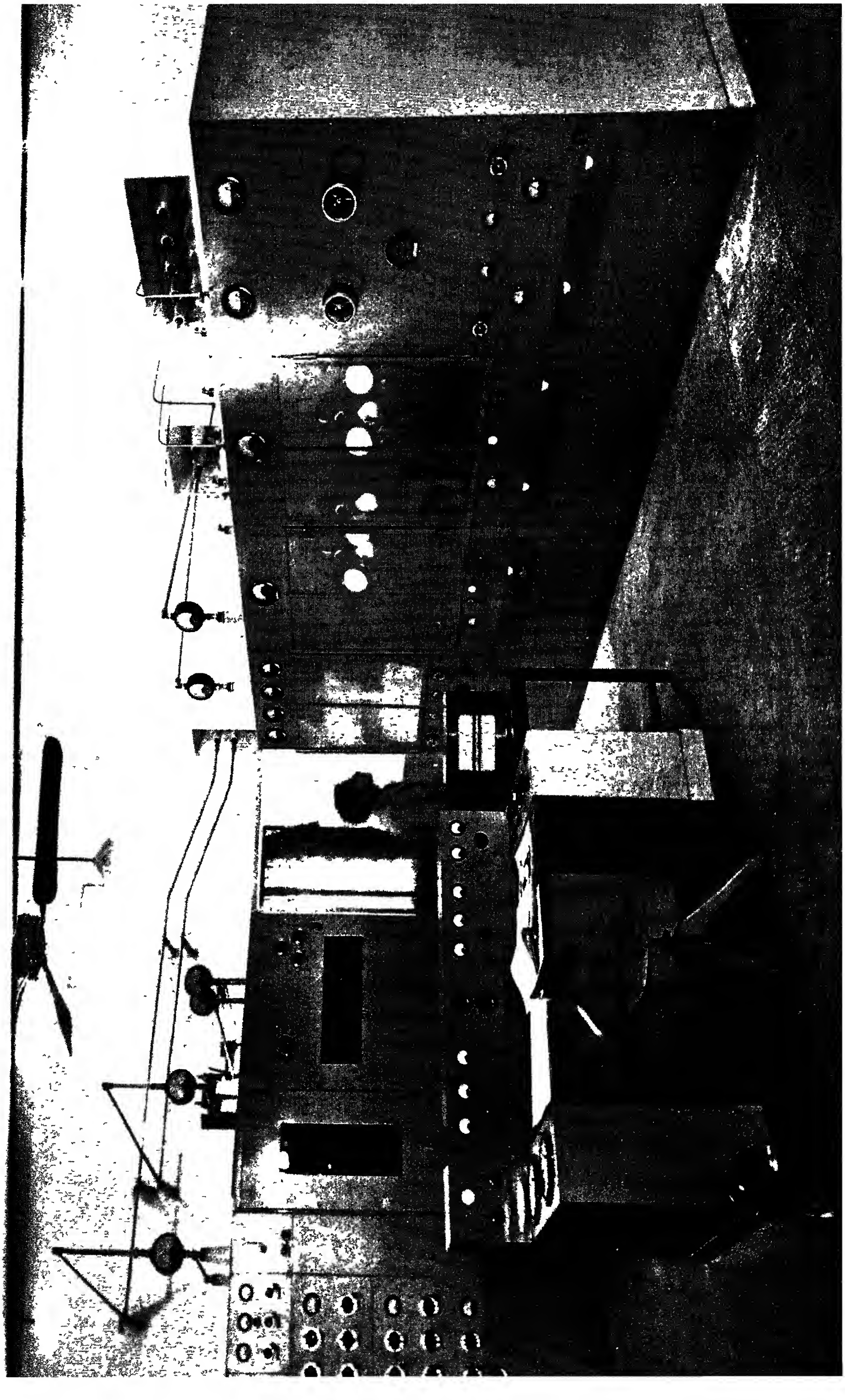
263. Of particualr importance for any broadcasting station is the accuracy of adjustment obtainable to the assigned operating wavelength of the station and the constancy of this adjustment from day to day. The greater the number of stations there are in operation the more important it becomes to keep to the exact wavelength required , otherwise interference is caused to and from other stations.

264. In modern broadcasting stations the carrier frequency (or wavelength) is generally produced by what is known as a ' Quartz Crystal Oscillator ' and this system is used by the shortwave stations. A quartz crystal when cut in a certain manner and associated with a thermionic valve has the property of oscillating at a constant frequency determined almost by the mechanical dimensions of the quartz crystal.

265. When the operating wavelength for a station is known, the ' quartz crystal ' is cut to a certain thickness so that it will vibrate at the required frequency to give this wavelength. As the power output from the quartz crystal and its associated valve is small, a number of amplifying stages follow the crystal oscillator stage. In the new shortwave transmitters, there are, three amplifying stages immediately after the crystal oscillator stage, a frequency doubler stage, which doubles the frequency generated by the crystal to the required carrier frequency of the station, and a high power amplifier stage on which the modulation is effected. Thus the radio frequency energy is amplified approximately 10,000 times from 1 watt at the crystal stage to 10 Kilowatts at the output stage. A block schematic diagram (Fig. 3) illustrates how the amplification of high frequency energy is carried out.

266. The frequency of oscillation of the quartz crystal is affected to some extent by temperature. A maximum variation of 50 parts in a million per degree centigrade change may occur in the oscillation frequency. To overcome this variation the crystal is mounted in a thermostatically controlled chamber which is maintained at a constant temperature of 55° C. The final result is that the frequency of operation of the transmitter does not vary more than 10 parts in a million for changes $\pm$ 15° C of the ambient temperature. A separate crystal is required for each wavelength on which the station operates and provision is made for six crystals in the thermostatically controlled chamber referred to previously. In addition, a duplicate chamber is provided with provision for six crystals which can be brought into service immediately in case of a failure of the first.

267. The crystal and high frequency stages assembled in separate compartments of the draw out type are mounted one on top of another on the transmitter panel installed centrally in the transmitter hall. Any



of the stages can be easily withdrawn and entirely removed from the panel for the purpose of servicing or replacing components. All the tuning adjustments and meters are brought on to the front of these compartments for facilitating change of wavelength between transmissions. The frequency doubler stage is mounted at the bottom of this panel while the final stage is accommodated in the right hand portion of the transmitter panel. Built-in spare valves are provided in these two stages which minimise the periods of breakdown on the transmitter in the event of failure of any of the valves in circuit.

(iii) Waverange.

268. The establishment of a broadcasting service by means of short-waves has necessitated the use of two wavelengths, one for the transmission by day time and the other by night. This is due to the different skip distances and attenuation offered by the transmission layers in the upper atmosphere during the day and night time. The 10 K.W. short-wave transmitters are capable of operation on any desired wavelength within a waverange of 30 to 90 metres in the case of Delhi and Bombay and 25 to 90 metres in the case of Madras and Calcutta. In addition, the transmitters afford facility for change of wavelength between transmissions within a short time of ten minutes.

(iv) Modulation System.

269. The system of modulation employed is known as "High Power Class 'B' Modulation". This is the most commonly used system in modern broadcast transmitters, and has the economy in power consumption due to the higher efficiency obtained.

270. The efficiency of Class 'B' over Class 'A' modulators was well understood by the pioneers in the broadcasting field. The Class 'B' modulators are one and a half times as efficient as the Class 'A' type. But this system was not adopted in the earlier days as a high percentage of distortion was introduced by it. The chief difficulty which confronted the broadcast engineer in adopting this system was in the design and manufacture of Class 'B' modulation transformer with low harmonic content. Years of research devoted to this problem have eventually got rid of this difficulty by use of suitable material for the core and spacing the windings in a pre-determined manner on the core of the transformer

271. The main modulator comprises two water-cooled valves in push-pull, transformer coupled to the output radio frequency stage. This modulator delivers 8 K.W. of undistorted audio-frequency power on 100 per cent modulation to the output stage. The energy produced by the microphone in the studio is therefore amplified approximately a million million times (10^{12}) between the microphone and the output of this stage (Fig. 3). The amplifiers behave linearly with increasing input voltages and the total harmonic content produced by them does not exceed 4 per cent. (Fig 4). The amplification of the system does not vary by more than $\pm$ 3 DB from 30 to 10,000 cycles per second (Fig. 5). The unweighted noise level on the carrier is 60 DB below 100 per cent. when modulated with a pure tone.

(v) The High Voltage Rectifier System.

272. One of the features of particular interest is the main high tension supply system. The high power water-cooled valves operate at a tension of 8000 volts and take a total current of approximately 4 amperes. This direct current power is obtained by stepping up the 400 volt A. C. supply through a high tension transformer ; the high tension A. C. is then rectified and passed through a smoothing system of chokes and condensers to provide the direct current voltage supply of 8000 volts. The rectifying element comprises four hot cathode mercury vapour valves with grid control. The hot cathode rectifier is the most efficient type known and efficiencies of 98 per cent. are normally obtained. They offer a further advantage in that a good voltage regulation is maintained in spite of a variable load offered by the modulators. The voltage drop across the mercury vapour valve is about 20 volts in 8,000.

273. A unique feature of this rectifier is the system of grid control previously mentioned A grid is incorporated in the separate rectifier valves which permits a number of functions to be performed. The rectifying valves only become conductive if the grid is maintained at the correct potential and the period over which the valve is conducting is determined by the phase of the grid potential. The high tension voltage can therefore be regulated from a low value up to the full voltage of 8000 volts by gradually altering the phase of the grids relative to that of the anode, by means of a phase regulator. The power required is negligible This system compares very favourably with the alternative method of controlling the main supply voltage, which requires an induction regulator in the primary circuit of the main high tension transformer carrying the total load current.

274. The introduction of the grids in the rectifier valves provides at the same time an effective protection for the rectifier system, as the rectifier valves can be made inoperative by placing a suitable negative potential on the grid. In this particular rectifier an automatic ultra-rapid safety device is incorporated for providing protection in case of overloads or heavy back-fire common in rectifiers of the above type

275 The safety device operates on the following principle. If for any reason, more than a pre-determined current flows through the rectifier, this current causes a high negative potential to be placed on the grids of the valves, rendering them inoperative. Simultaneously the phase regulator reverts to the low voltage position and the tension then automatically increases to the normal value of 8000 volts if the cause of overload has cleared. A dead short circuit can be cleared in about half a cycle without tripping the mechanical circuit breakers. The automatic operation is made possible by a series of contacts mounted on the phase regulator and relays, which work in conjunction with the safety device panel consisting of a high frequency oscillator and rectifiers for providing the necessary amount of negative potential to the rectifier grids.

276. In broadcasting transmitters overloads are caused occasionally by accidental overmodulation and by other causes. When this occurs, the only result evident to the listener is a click in the receiver and a re-

duction in signal strength for a period of about five seconds required for the gradual increase of high tension voltage. This is a great improvement over the usual methods of protection which causes a circuit breaker to open ; and the programme is then interrupted until the main induction regulator is reduced to a minimum and the circuit breaker re-closed.

277. A further feature which deserves mention here, is the modulation indicators which are provided on the control desk in the transmitting station One of these indicates the percentage of modulation of the transmitter at any instant. The second meter known as the ' Overmodulation Indicator ' only indicates an overmodulation of the transmitter. This meter is particularly useful in adjusting the modulation level of the transmitter. A further function is, however, provided by the special circuit which operates this meter. The current which operates the meter is given by the out of balance current of an alternating current Wheatstone Bridge and only flows on overmodulation of the transmitter. When no current is flowing the bridge impedance is high. When current flows the impedance drops, depending on the magnitude of the current. This circuit is shunted across the audio frequency line to the transmitter so that the excess voltage causing the overmodulation is largely absorbed. A limiting action is therefore obtained, which makes serious overmodulation of the transmitter impossible.

(vi) Aerial System.

278 The aerial system is relatively simple. A horizontal half-wave dipole is provided approximately half a wavelength above the ground. This is fed by a two wire transmission line which runs to the centre of the dipole aerial. The transmission line is terminated in such a manner that standing-waves on the lines are avoided.

(vii) The 5 Kilowatt Mediumwave Transmitter.

279. The 5 K.W. mediumwave transmitter is the first station of this power to be put into operation with air-cooled valves. Up to this time the power limit for stations with air cooled valves has been about 2 K. W. Above this power, valves with water-cooled anodes have been employed The use of water cooling involves considerable additional complications which it is very desirable to avoid if possible such as pumps, water cooling system and water piping from the valves to the pumps and cooling system.

280 In the case of mediumwave transmitting equipments, valves with air blast cooling are used. Four valves are used in the radio frequency output stage and four valves in the main modulator stage. The smaller valves in the low power stages are cooled by natural air circulation.

281. The transmitter is composed of four panels placed in a line : the A. C. control panel, the high voltage rectifier panel, the high frequency amplifier panel and the modulator panel The master oscillator panel is mounted separately on a rack placed at the back of the transmitter panels. The transmitter hall is divided into two portions by a partition wall. The partition wall is provided with a central opening of requisite dimen-

sions so as to permit the transmitter panels to sit flush with the surface of the wall in their final position. The arrangement, besides presenting a neat appearance as a whole, affords a two-fold advantage : it isolates all noise due to the exhaust fans and the air blowers, and prevents the transmission of heat dissipated by the valves used on the transmitter.

282. One particular feature of importance to note in the case of the mediumwave stations is the absence of rotating machinery except for two small blowers used for the purpose of cooling the power valves. The filaments of all the valves used on the transmitters, except in the case of the final high frequency amplifier stage, are heated by direct current obtained by the conversion of A. C. voltage by means of copper oxide rectifiers. In the case of the final high frequency amplifier the filaments are lighted by A. C. current and are connected in a special manner so as to reduce the superimposition of A. C. hum on the carrier in order to maintain the desired noise level.

283 The transmitter which is rated at 5 K. W.—this being the radio frequency energy delivered to the aerial system—uses high power Class 'B' modulation, and a quartz crystal for the master oscillator system, as in the case of the 10 K. W. shortwave transmitters. A block schematic diagram (Fig. 6) shows the entire arrangement. The transmitter is designed for operation on any desired wavelength between 200 and 545 meters, and consumes approximately 28 K. W. of energy from the electric supply mains. The switching operation of the transmitter, carried out in a particular sequence, is entirely automatic taking about 2 minutes from start to finish.

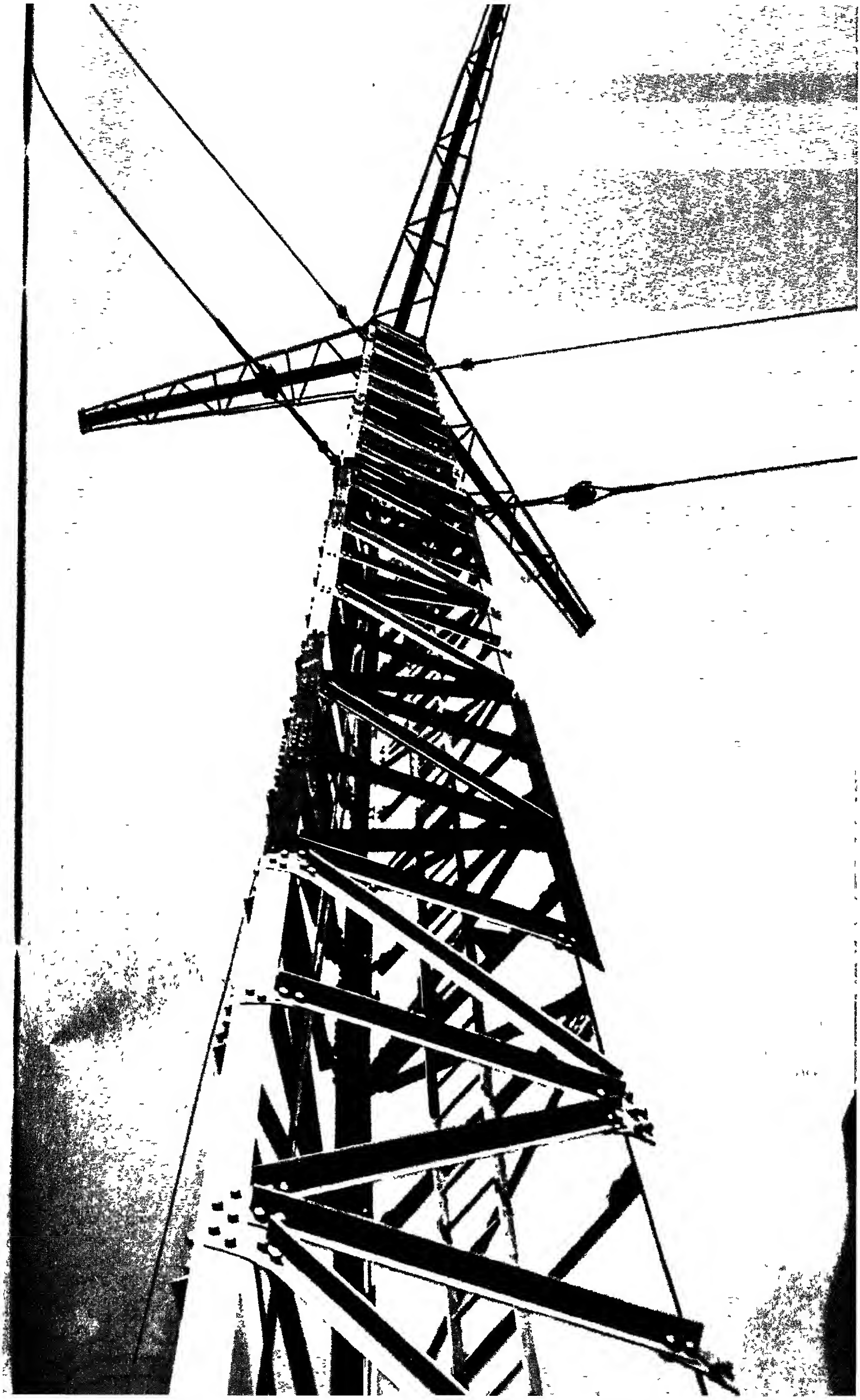
284. The frequency response of the transmitter is sensibly linear between 30 to 10,000 cycles per second (Fig 7). The harmonic content and the noise level on the carrier is also well within the specified figure of 4 per cent. and — 60 DB below 100 per cent modulation respectively.

(viii) The Earth and Aerial System.

285. The aerial system takes the form of a single self-radiating mast, 180 feet high and insulated from earth for the requisite radio frequency potential. This is the most modern type of aerial system that is used on the medium and long wavelengths. A 'capacity top' is added at the top of the structure to increase the effective height of the mast. The entire structure supported by six insulated stays rests on a case hardened steel ball which in its turn is placed in a groove made in the steel plate fixed on the top of three cylindrical porcelain insulators of 10″ diameter.

286. The mechanical and economic considerations in the choice of a single mast radiator are obvious. The electrical advantage offered by the single mast of height between quarter and half the operating wavelength of the transmitter is that it gives equal radiations in all directions, as against the case of an aerial system supported by two masts which obstruct the radiation and cause an unsymmetrical radiation pattern from the aerial system.

287. The earth system in the case of a mediumwave station plays an important part in maintaining a high aerial efficiency considered as a



ratio between the power input and the power output, i e., power radiated. Efficiencies of the order of 95 per cent. are obtained by using an aerial system consisting of 120 radial wires of length equal to half the operating wavelength of the station. This leads to the acquisition of a large area of land for the station. In the case of mediumwave centres an earth system of 120 radial wires but of length approximately equal to three eighth the operating wavelength of the station has been adopted.

288 The earth system consisting of 120 radial wires of 16 S. W. G. extends in all directions from the mast, taken as the centre, up to the boundary of the site and forms around it an efficient earth net. The individual earth wires are brought on to four copper earth plates buried around the mast and carefully soldered to provide an efficient contact. The four earth plates are interconnected by heavy copper strips, which are then taken to the aerial coupling system housed in the feeder hut. With such an earth system an aerial efficiency of 85 per cent. is obtained.

(ix) The 5 Kilowatt Shortwave Transmitter.

289. An additional shortwave transmitter rated at 5 K. W. aerial power has been installed at Delhi and uses air cooled valves like the mediumwave transmitting equipments and does not differ considerably in its construction and design as well.

290. The transmitter is capable of operation on any desired wavelength between 14 and 100 metres, and 112.5 and 150 metres and employs Class ' B ' Modulation on the final power stage. All the filaments of the transmitter valves are lighted by direct current obtained by means of a motor converter set.

291. The only point of difference which deserves mention in the case of the 5 K. W. shortwave transmitter is the master oscillator system. The transmitter employs the Marconi Franklin compensated oscillator which gives a stability of *plus* or *minus* 1 part in 20,000 cycles without the complication of temperature control and voltage stabilising devices.

292. This device is of special design to ensure constancy of frequency with variation of temperature, anode tension, and filament voltage. The effects of varying tension are counteracted by means of a compensating condenser which is so adjusted that any increase in inductance due to expansion is balanced out by a corresponding decrease of the capacity of the compensating condenser. The complete unit is lagged to prevent rapid temperature changes of any of the internal parts, and the oscillatory circuit and compensating condenser are completely screened by the double cylindrical brass case in which they are contained. The unit is insulated from vibration by mounting in a suitable cradle.

293. The master oscillator system is immediately followed by three stages of frequency multipliers which can be adjusted to give any harmonic from the 2nd to the 18th of the fundamental generated frequency of the oscillator. This enables the transmitter to operate on any required spot wavelength within the waverange specified

(x) The Madras 250 Watt Mediumwave Transmitter.

294. The low power mediumwave transmitter is installed in the studio building at Egmore. It is unnecessary here to go into details regarding the various circuits and their performance as no novel features are involved in their design. However, the system of modulation employed differs from that of other transmitters installed in India, modulation being effected on the suppressor grid of the final stage consisting of a single pentode valve. This type of modulation though it suffers from the point of view of lower efficiency, offers an advantage in that a small amount of audio frequency energy is sufficient to modulate the transmitter fully. The latter fact permits a high voltage rectifier system of a lower capacity being used which is not the case for operation of choke or Class ' B ' Modulation systems.

295. The output from the transmitter is fed by means of a high frequency, low loss cable—the only one of its kind used in India—to the aerial system consisting of a single 120 feet self-radiating mast. The mast is made in three tubular sections with a capacity structure at its top to give a better effective height for the radiating element. The entire structure supported by nine stays is mounted on the roof of the feeder hut, constructed for the purpose in the premises of the studio building. As the mast itself serves the purpose of the radiating element, it has been insulated for a working potential of two thousand to three thousand volts from ground.

296. Mechanical considerations in the design of a mast require that no excessive shearing stresses should act on the foundation bolts of the masts or the insulator supporting the mast. The mast is therefore made to rest on a case hardened steel ball placed on the top of the insulator. Thus any lateral thrust due to wind pressure on the mast, etc., is taken up by the stays themselves instead of being transmitted as a shearing force to the insulator or foundation bolts. This fact further enables an economical design of the feeder hut for a downward thrust due to the weight of the mast and tension in the stays only. In the present case the total down thrust on the roof of the feeder hut is of the order of 5,000 lbs.

TABLE 3.

Particulars.	Rated aerial power (K.W.)	Total power consumption per hour (K.W.H.)	Overall efficiency (per cent).
Philips Transmitter. Type K.V.F.H. 10/12 A.	10	51·0	19·6
Marconi Transmitter. Type S.W.B.11	5	25·9	19·3
Marconi Transmitter. Type B. S. 5.	5	25·5	19·6
Philips Transmitter. Type K.V.F.L. 250/62	0·250	2·0	12·5

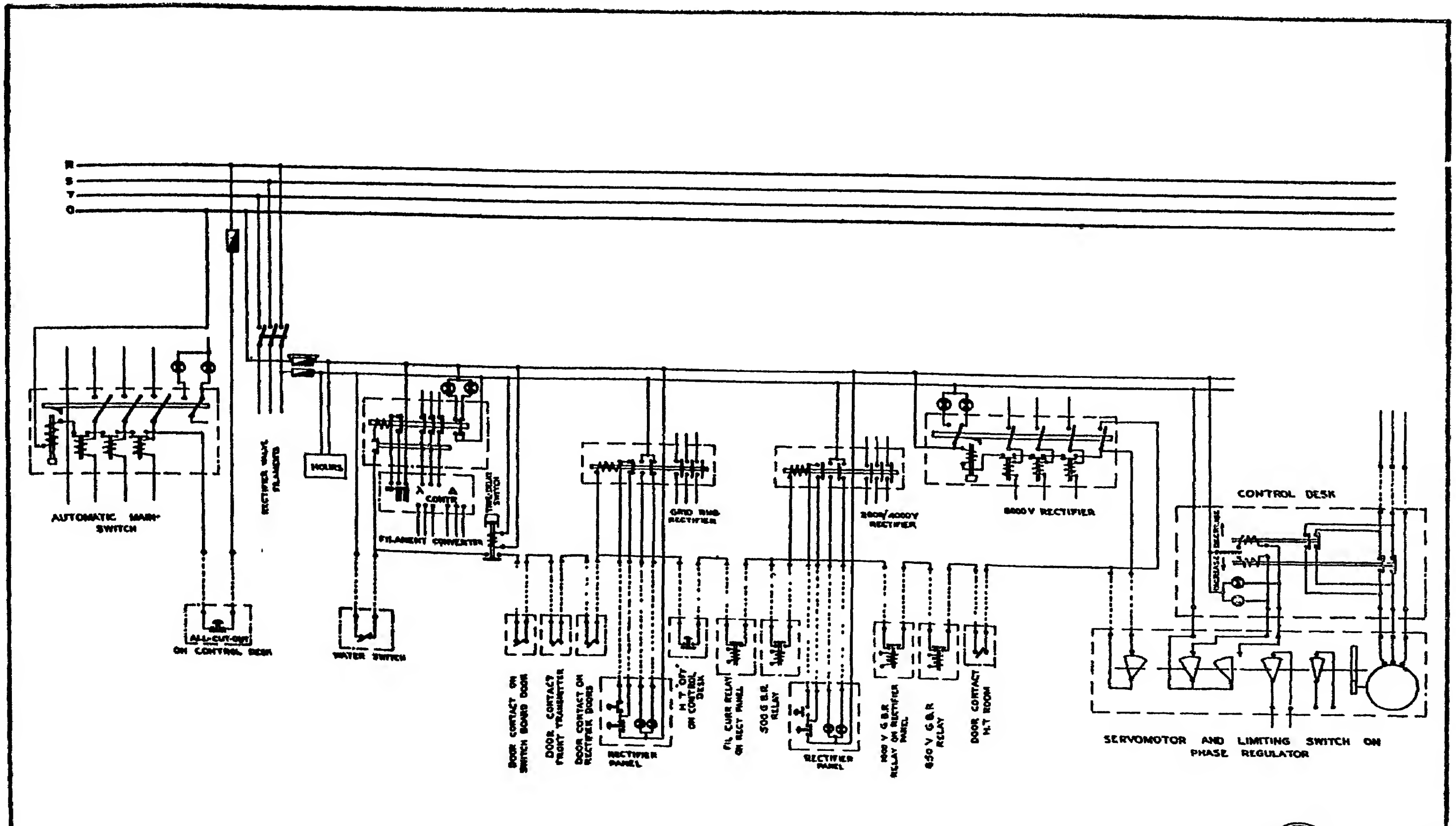

R
S
T
O
AUTOMATIC MAIN SWITCH
ALL-CUT-OUT
ON CONTROL DESK
RECTIFIER VALVE FILAMENTS
HOURS
WATER SWITCH
FILAMENT CONVERTER
TIME-DELAY SWITCH
GRID BIAS RECTIFIER
2000/4000V RECTIFIER
8000V RECTIFIER
CONTROL DESK
INCREASE
DECREASE
DOOR CONTACT ON SWITCH BOARD DOOR
DOOR CONTACT FRONT TRANSMITTER
DOOR CONTACT ON RECTIFIER DOORS
RECTIFIER PANEL
H.T. 'OFF' ON CONTROL DESK
FIL CURR RELAY ON RECT PANEL
500 G.B.R. RELAY
RECTIFIER PANEL
1000 V G.B.R. RELAY ON RECTIFIER PANEL
650 V G.B.R. RELAY
DOOR CONTACT H.T. ROOM
SERVOMOTOR AND LIMITING SWITCH ON PHASE REGULATOR
INSTALLATION
DEPARTMENT

Fig.1

FLOOR PLAN
SHORT-WAVE TRANSMITTING STATION

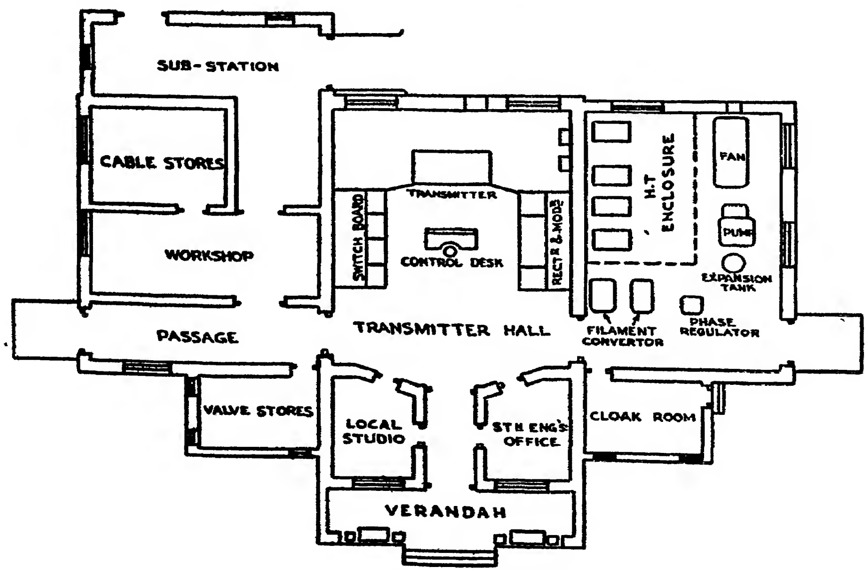


Fig 2

INSTALLATION AIR DEPARTMENT

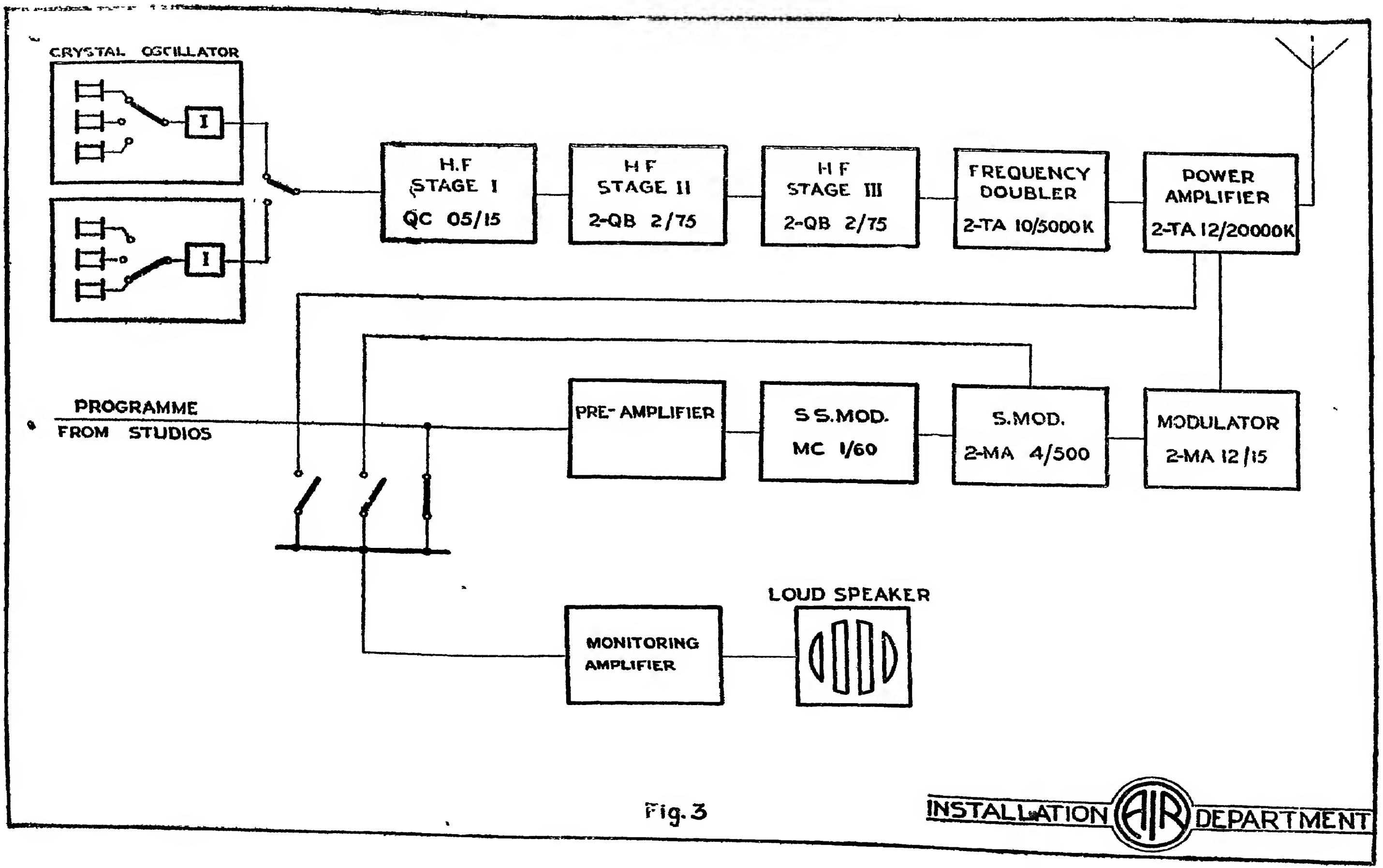

CRYSTAL OSCILLATOR
I
I
H.F STAGE I
QC 05/15
H F STAGE II
2-QB 2/75
H F STAGE III
2-QB 2/75
FREQUENCY DOUBLER
2-TA 10/5000K
POWER AMPLIFIER
2-TA 12/20000K
PROGRAMME FROM STUDIOS
PRE-AMPLIFIER
S S.MOD.
MC 1/60
S.MOD.
2-MA 4/500
MODULATOR
2-MA 12/15
MONITORING AMPLIFIER
LOUD SPEAKER
INSTALLATION AIR DEPARTMENT

Fig. 3

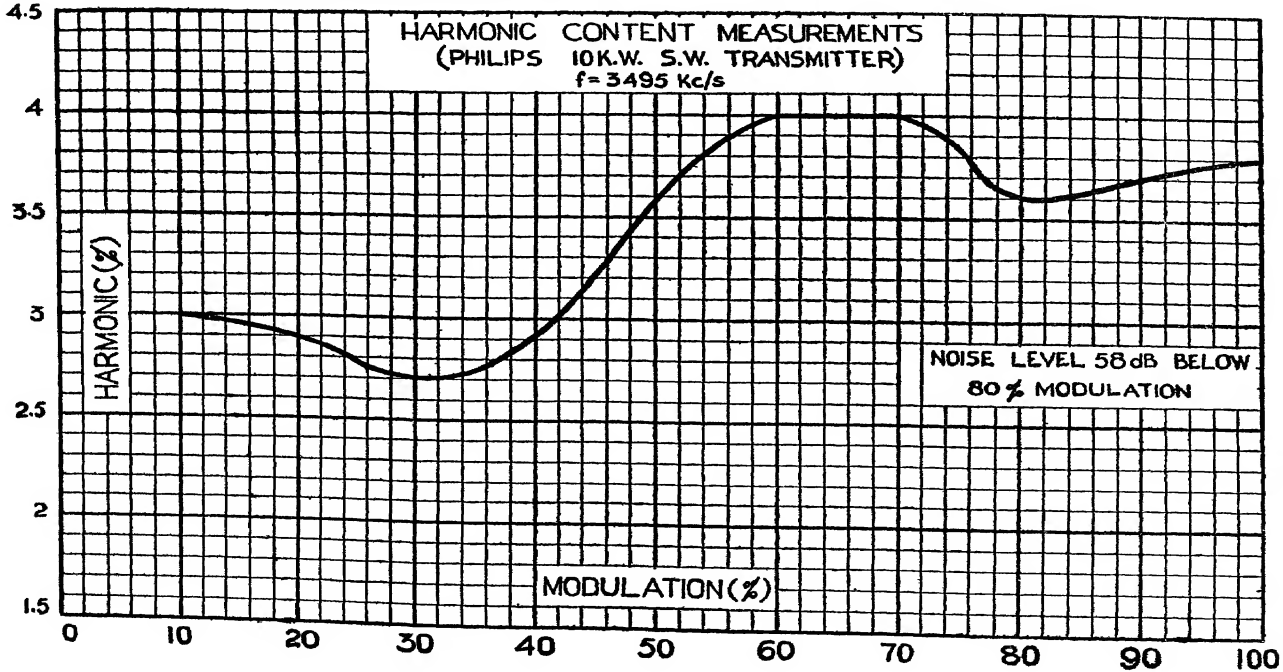


Fig. 4

INSTALLATION AIR DEPARTMENT

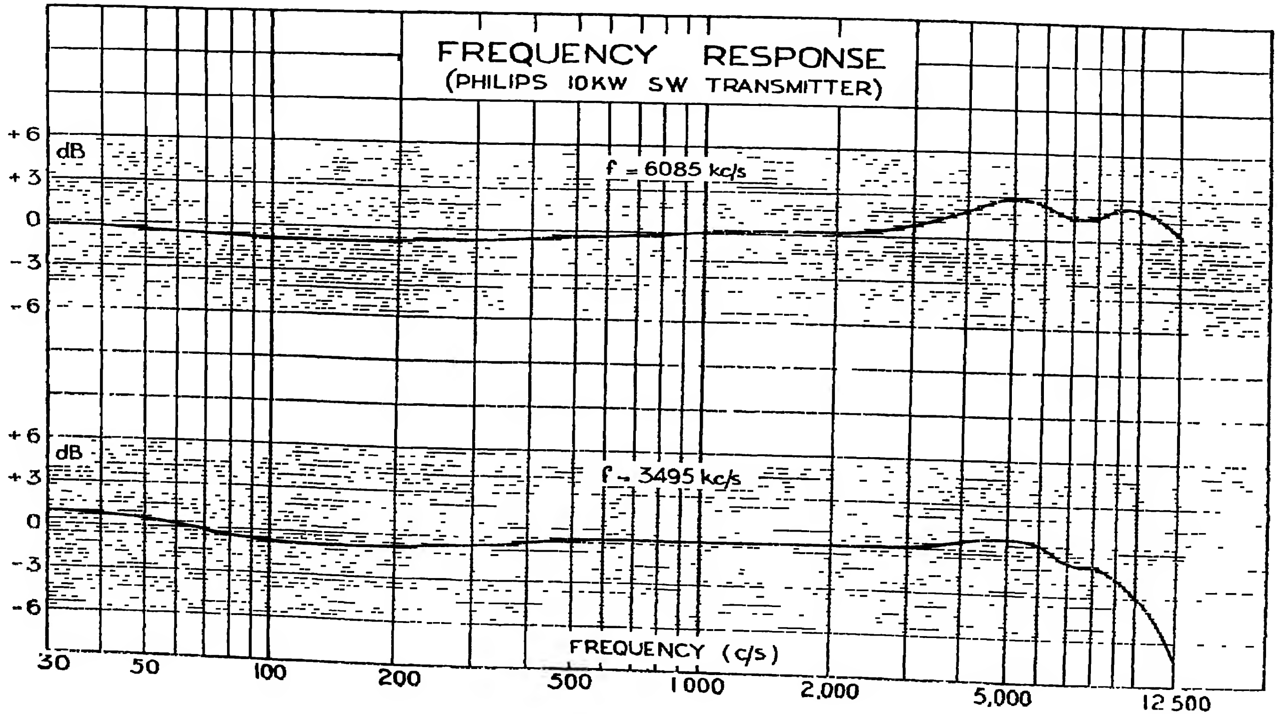


Fig. 5

INSTALLATION AIR DEPARTMENT

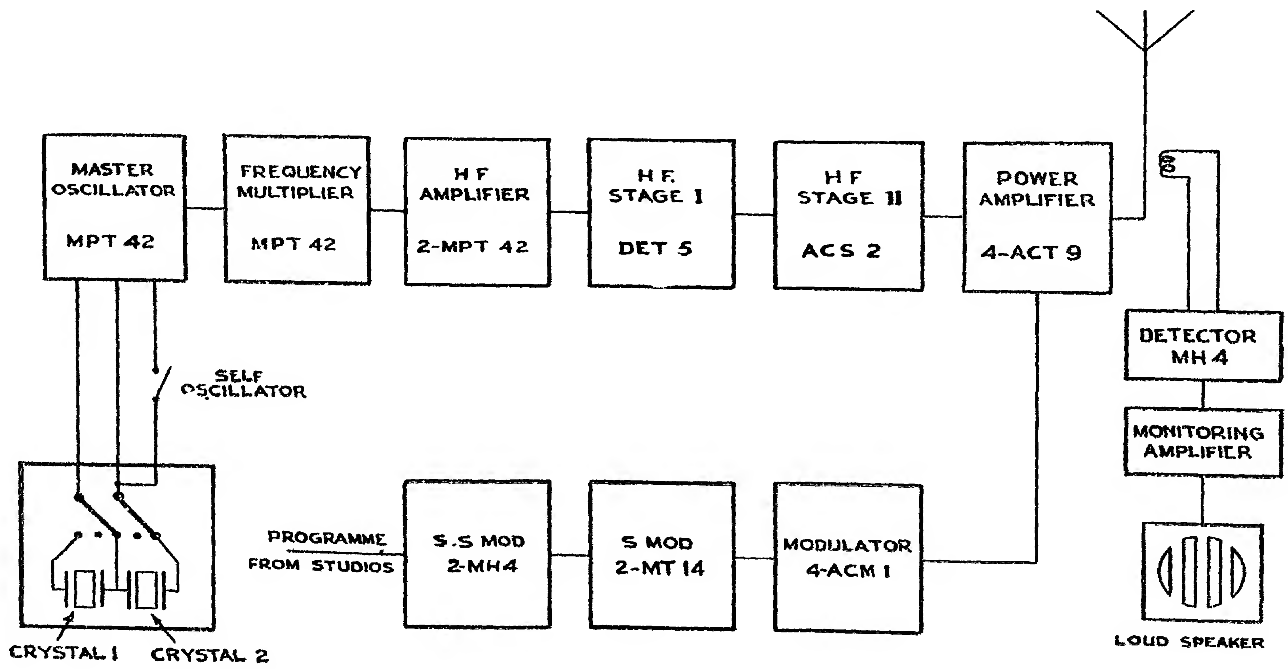


Fig. 6

INSTALLATION AIR DEPARTMENT

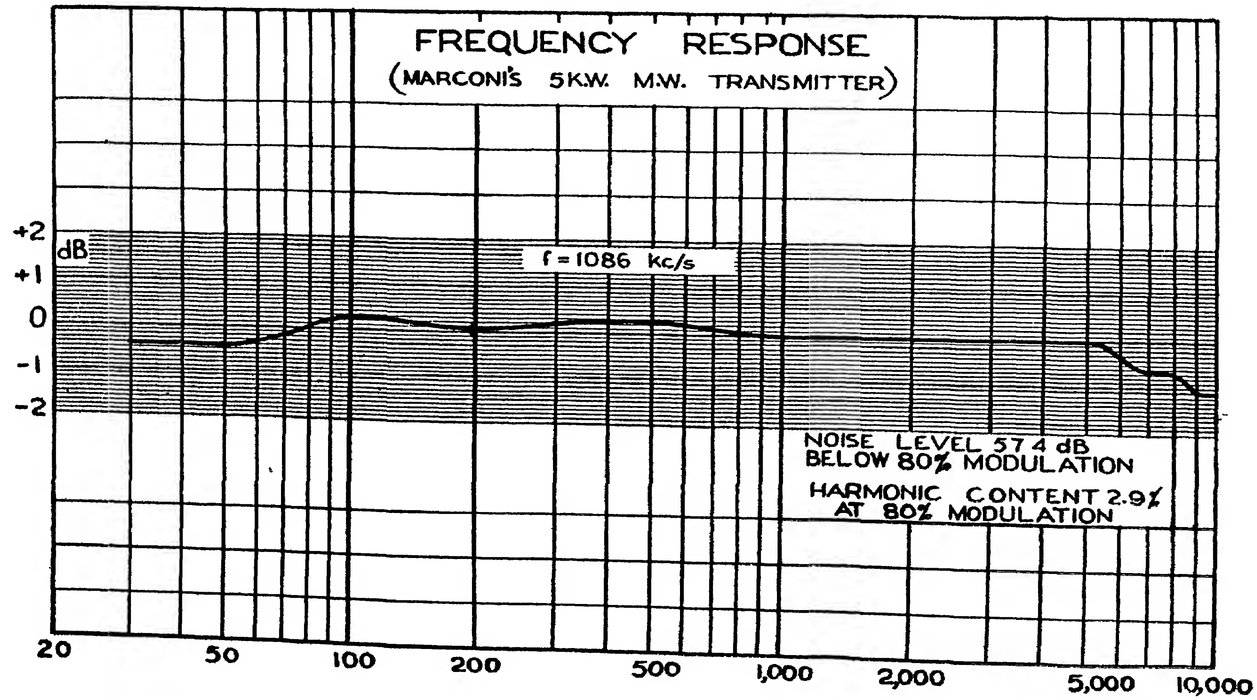


Fig. 7

INSTALLATION AIR DEPARTMENT

SECTION 7.

Studio Design Practice for Stations of All India Radio.

297. The design of studios for broadcasting is a subject of special importance to the listener, as it has a very real effect on the naturalness of reproduction of performances taking place in the studios. The methods adopted by this department in the design of studios at new broadcasting centres differ from generally accepted practice in at least one important manner—in that existing buildings have been adopted for studio purposes in preference to the construction of special new buildings for the purpose. The construction of special studio buildings at each of the new centres was not undertaken for various reasons, among these the time required to acquire suitable land and construct the buildings, the shortage of engineering effort during the initial stages of the new development programme, to work out the special features relating to the studio design, and the desirability of obtaining more experience of local conditions before the appreciable capital outlay involved in constructing special buildings could be undertaken.

(i) Requirements of Studios.

298. The three special requirements of rooms intended for studio purposes are (*a*) silence (*b*) ventilation (*c*) acoustics.

299. The requirement for absolute silence in rooms intended for broadcasting studios is often the most difficult condition to meet. This applies particularly in large cities where traffic noises are serious and, of even greater importance, where vibration due to heavy traffic may be transmitted through the frame of the building to the studios. This makes it necessary in some cases to adopt a special studio construction in which the rooms intended for studios are located internally in the building and surrounded by offices. The studio is also 'floating', that is, no rigid connection exists between the studio and the main frame of the building. The weight of the studio is taken on resilient supports. In the case of studios of All India Radio the problem is simpler, as traffic disturbances need only be anticipated in one or two of the broadcasting centres, for example, Bombay and Calcutta. In choosing existing buildings in cities such as Lahore, Lucknow, Trichinopoly and Dacca, precautions have been taken to choose a building with a sufficiently large compound, so that the building is well set back from the road. To further reduce noise, all windows in the rooms to be used for studios are blocked with sound insulating material leaving only the one or two special sound proof doors in each studio. Any other existing doors are blocked. It has been found in practice that sufficient protection against noise is obtained by the three precautions of choosing a suitable position for the house, by blocking and sound-proofing all unnecessary openings in the rooms intended for studios, and by providing sound-proof doors where entrance is obtained to the studios.

300. Insulating the studios against sound in this manner immediately raises the important question of ventilation, as the room treated as previously mentioned becomes an air tight box in which a number of people will be performing. When steps are taken to build a special building for

studio purposes, with the appreciable capital outlay involved, it is invariably the practice to provide the rooms intended for studio purposes with full air-conditioning facilities. In this case air of the correct temperature and humidity is led from a central air-conditioning plant through ducts to each studio and similar return ducts are provided for the spent air returning from the studios to the air-conditioning equipment. Air conditioning, however, can in the general case only be satisfactorily applied if provision is made for it in the plans of construction of the building and other suitable precautions with regard to heat insulation are observed.

301. The only centre of All India Radio where newly constructed premises have been occupied is at Bombay where a part of the new Central Offices Building on Queens Road is used for studio and office purposes. In this case the necessary ducts and other equipment required were provided during the construction of the building and full air conditioning facilities are provided. At the other centres where existing houses or bungalows are adapted for studio purposes, it is not generally possible to provide full air-conditioning facilities nor can the expenditure involved be justified. In these cases ventilation is obtained by providing exhaust fans which extract air from each studio. These exhaust fans are mounted at the end of a long sound absorbing duct which runs from the studios to the outside air. In this manner the noise of the fan is prevented from entering the studios. Similarly, special sound absorbing air inlet ducts are provided running from outside into the studios to permit the entrance of fresh air. The exhaust fans from each studio are controlled from a central position and adjusted depending upon the number of performers in the studio, etc. With this system of ventilation it is evident that in the best case the temperature and humidity of the air in the studio will be the same as the temperature and humidity of the outside air In addition special silent ceiling fans are provided in each studio operated at low speeds, as the rapid movement of air disturbs the studio microphone.

302. The third requirement of a broadcasting studio refers to the acoustic properties of the room. It will be well-known from experience that any sound produced in a room takes a certain period of time to die away to inaudibility. With the unusually high ceilings present in Indian houses, and especially during the summer time when carpets are generally absent, a very appreciable time is required for any sound to die away to inaudibility. The time required for a sound to decrease to one millionth part of its initial energy is known as the ' reverberation time ' of the room. The problem of the acoustic treatment of studios is to adjust the time required for a sound to die away to a value which has been decided upon beforehand. The correct reverberation time is not in any way a fundamental unit. It can only be based upon physiological factors, that is, by determining by experiment the reverberation time of a studio or a concert hall which the majority of individuals consider gives satisfactory results. The information which is used in the acoustic treatment of studios has been built up to a large extent by determining the reverberation times of concert halls or rooms which are known to have good acoustic properties and basing the design of studios on this information. The result of a great deal of study and experiment on this subject has indicated that there is an optimum reverberation time for a room of a given size and

for a given performance. The problem of acoustic treatment in studios is to adjust the reverberation time of the empty room, which is originally much too large, to this desired value. This is done by treating the surface of the room with sound absorbing materials.

(ii) Acoustic Treatment.

303. A question which was given considerable attention by All India Radio before treatment of the new studios commenced was the material which should be used to meet the special conditions of India. A series of experiments were carried out in the experimental studio by the Research Department at Delhi on the different types of sound absorbing materials available and eventually a vegetable fibre material was chosen which is available in sheets of various sizes, the most commonly used size for studio treatment being $8' \times 4' \times \frac{1}{2}''$ thick.

304. A difficult problem which is invariably met with when a material such as this is chosen for sound absorption is that the sound absorption varies over the frequency range (or octaves) of the musical scale. In practice it is found that instead of obtaining the desired approximately equal absorption over the frequency range required, absorption is high at the high frequencies and low at the low frequencies. This results in a very unsatisfactory sound from the studios. There is then a tendency for the low frequencies to resonate or 'boom' while the heavy absorption of the high frequencies and over-tones of the musical instruments renders the performance lifeless. The method adopted to overcome this effect when any simple method of acoustic treatment such as is now being described is used is to obtain the required absorption of the lower frequencies by resonance of the acoustic material. To effect this a certain proportion of the total treated area must be supported in such a manner that it vibrates on the lower frequencies and absorbs energy in this manner. In the case of the new studios of All India Radio this is done by supporting the acoustic material for the lower half of the four walls away from the walls on battens. The material supported on these battens has a certain unsupported area which absorbs energy at low frequencies. The particular method used solves the problem of absorption at the lower frequencies and at the same time a decorative effect is obtained in the rooms.

305. The reverberation time of a studio is determined by a 'Reverberation Time Measuring Equipment'. This equipment enables the time required for the sound energy at any frequency to die away to a millionth part of its initial energy to be determined and by taking measurements on the various octaves throughout the musical scale the reverberation characteristic of a studio is determined.

(ii) Measurement of Reverberation Time.

306. The reverberation times of two different studios at the Lahore Station are shown in Figs 1 and 2. The new studios at the Lucknow Station have been similarly treated and have similar characteristics. These reverberation times are approximately the optimum values for the size of the rooms and the type of performance for which they are intended.

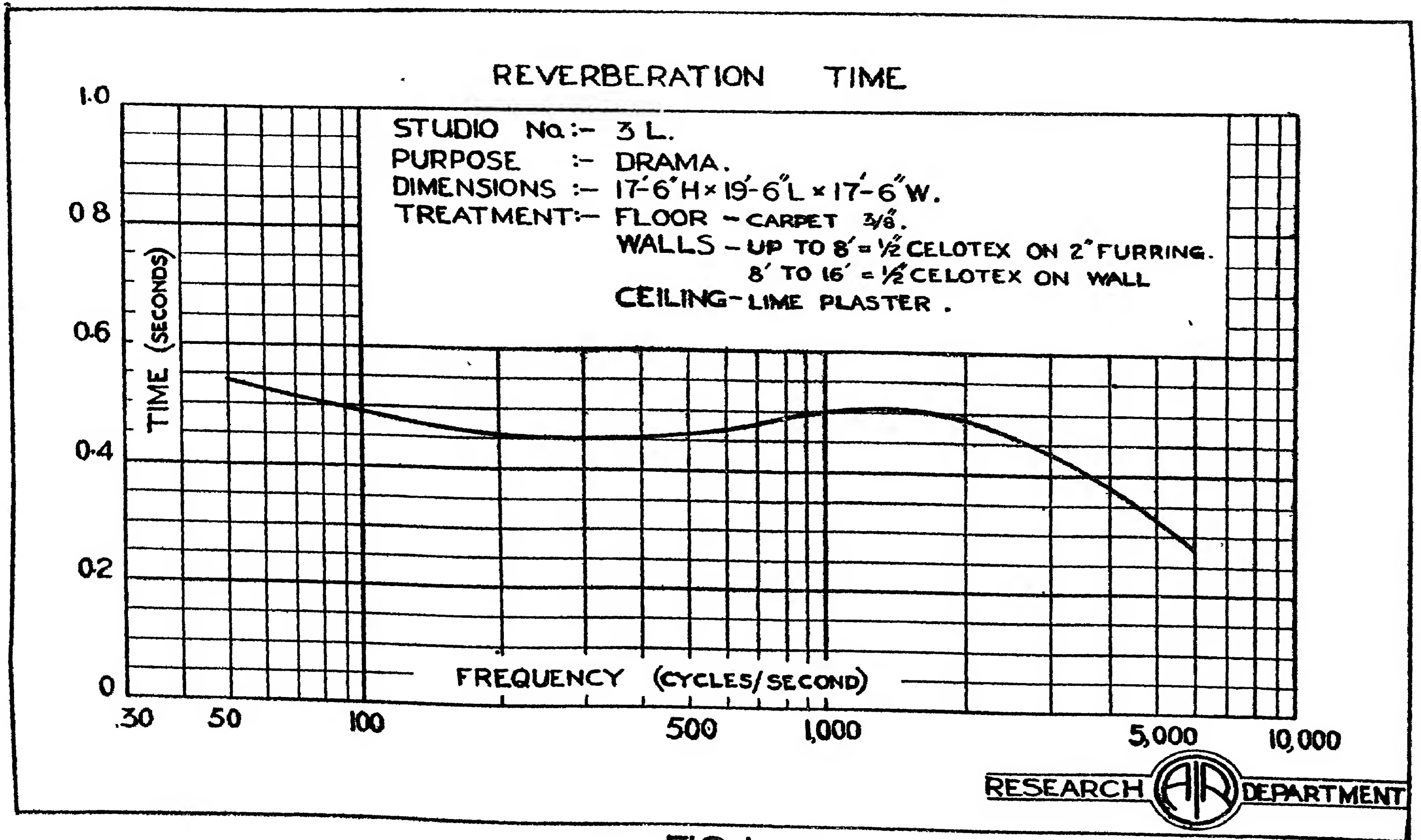
307. The reverberation time measurements made on one of the old studios without the special treatment to obtain bass absorption are shown in Fig. 3. These studios are treated with curtains and no special provision is made for absorption of the low frequencies by resonance. The increase of reverberation time on the lower frequencies is very evident and also the excessive absorption of the high frequencies. The effect of this is to give ' boominess " and lack of brilliance in the performance.

308. The method of application of the acoustic material to the walls of the new studios is evident from the illustrations.

(iv) Special Studio Facilities.

309. Each studio is also provided with a number of other special facilities. An electric clock is provided operated from a master clock in another part of the building. The clock is maintained accurately to the correct time by means of time signals In order that the officer in charge in the studios may know when the programme is about to commence or in order that he may indicate when it is finished a signalling system is provided from each studio to the control room which operates by a system of coloured lights. In addition a red warning light is provided on both sides of the sound proof doors leading into the studios which illuminates as soon as the microphone is ' live '. The smaller studios are provided with a single microphone, the large European Music and Indian Music Studios are provided with two microphones, one of which is used for the artists, while the second is mounted on the announcer's table. In front of the announcer is a control unit which permits him to switch over from the artists' microphone to the announcer's microphone and *vice versa.* For special cases both microphones may be used together. This is sometimes required for certain special musical performances : the second microphone in this event is removed from the announcer's table and suitably mounted elsewhere in the studio.

310. The method of studio treatment which has been developed has proved to be very satisfactory and inexpensive. This treatment is being adopted for the studios now in use or under construction at all the A.I.R. centres.



REVERBERATION TIME
STUDIO No:- 3 L.
PURPOSE :- DRAMA.
DIMENSIONS :- 17'-6"H × 19'-6"L × 17'-6"W.
TREATMENT:- FLOOR - CARPET 3/8".
WALLS - UP TO 8' = 1/2" CELOTEX ON 2" FURRING.
8' TO 16' = 1/2" CELOTEX ON WALL
CEILING - LIME PLASTER.
TIME (SECONDS)
1.0
0.8
0.6
0.4
0.2
0
FREQUENCY (CYCLES/SECOND)
30
50
100
500
1,000
5,000
10,000
RESEARCH DEPARTMENT

FIG. 1

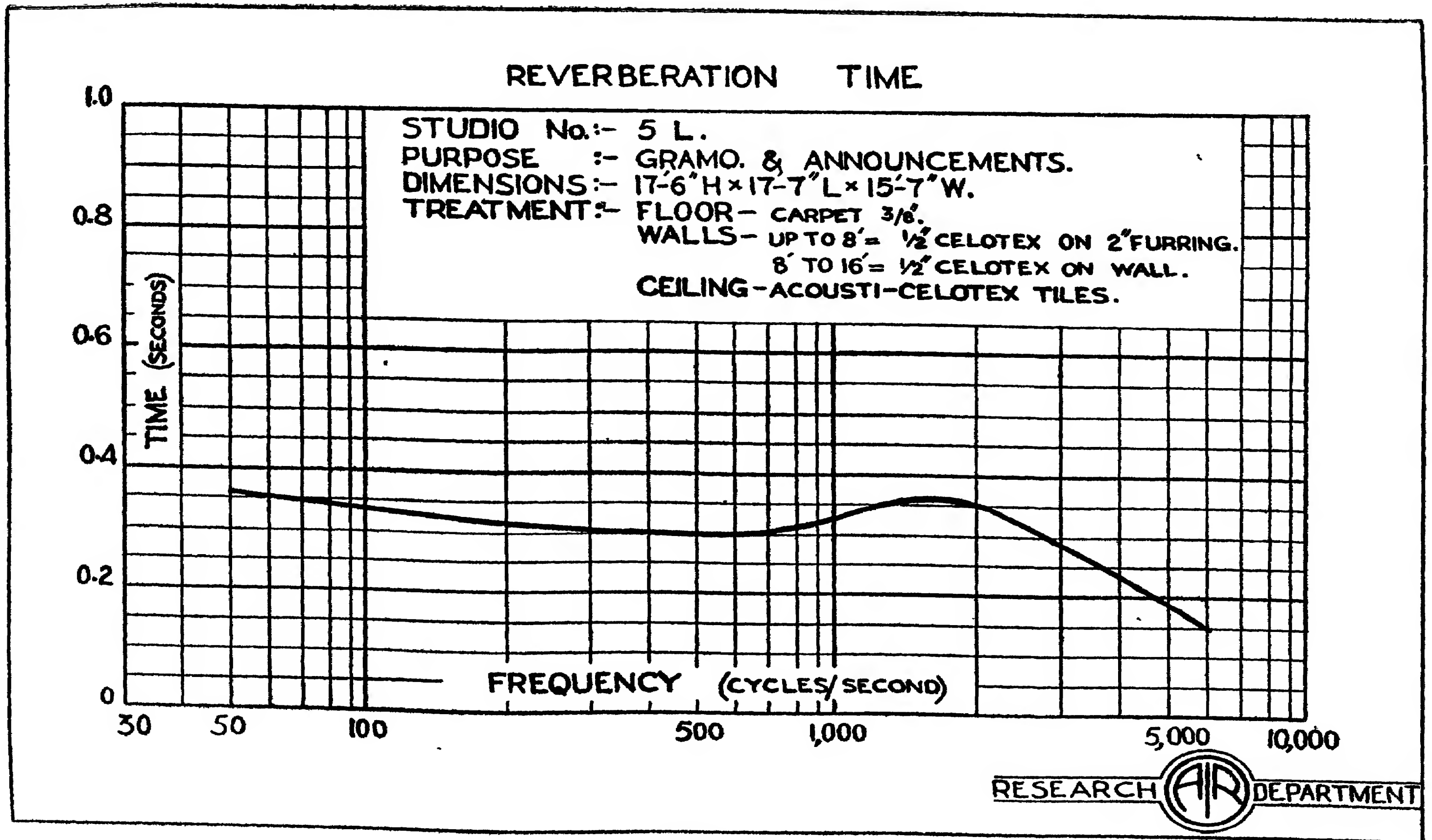
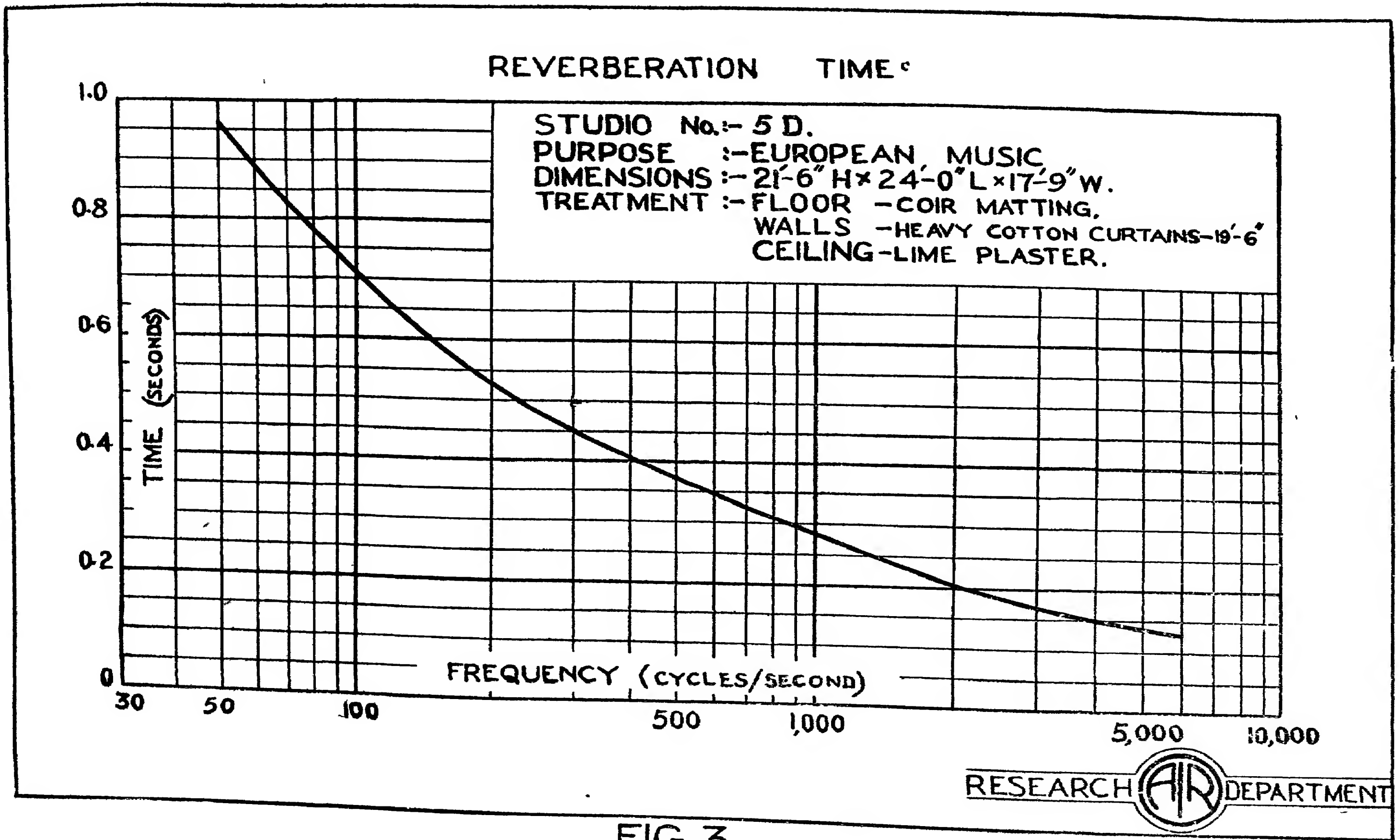

REVERBERATION TIME
STUDIO No.:- 5 L.
PURPOSE :- GRAMO. & ANNOUNCEMENTS.
DIMENSIONS:- 17'-6" H × 17'-7" L × 15'-7" W.
TREATMENT:- FLOOR - CARPET 3/8".
WALLS - UP TO 8' = 1/2" CELOTEX ON 2" FURRING.
8' TO 16' = 1/2" CELOTEX ON WALL.
CEILING - ACOUSTI-CELOTEX TILES.
TIME (SECONDS)
1.0
0.8
0.6
0.4
0.2
0
30
50
100
500
1,000
5,000
10,000
FREQUENCY (CYCLES/SECOND)
RESEARCH DEPARTMENT

FIG. 2



REVERBERATION TIME
STUDIO No.:- 5 D.
PURPOSE :-EUROPEAN MUSIC
DIMENSIONS :- 21'-6" H × 24'-0" L × 17'-9" W.
TREATMENT :- FLOOR -COIR MATTING.
WALLS -HEAVY COTTON CURTAINS-19'-6"
CEILING-LIME PLASTER.
TIME (SECONDS)
1.0
0.8
0.6
0.4
0.2
0
FREQUENCY (CYCLES/SECOND)
30
50
100
500
1,000
5,000
10,000
RESEARCH AIR DEPARTMENT

FIG. 3

SECTION 8.

The Todapur Receiving Centre.

311. In the scheme for the expansion of broadcasting in India, the Government sanctioned the erection of a Receiving centre at Delhi. This is located at Todapur, on the outskirts of New Delhi and is intended to pick up for relay the shortwave programmes from Europe or from A.I.R. stations in India. Madras and Calcutta will have similar Receiving centres shortly, and the other mediumwave stations will be added to this list as necessity arises.* All these Receiving centres will be of the same general design as the one at Todapur

(i) Choice of Site.

312 The sanction for the Delhi centre was received by the end of December 1936 and tests were made at various possible sites to determine their suitability. The aerial systems require a large plot of land which should be flat and fairly level The site should be free of electrical interference and it is usually necessary to locate it at least half a mile away from any High Tension or D. C. mains. Highways carrying motor traffic have to be avoided because of the interference created by ignition systems, and the neighbourhood of aerodromes is unsuitable for the same reason. Owing to these requirements the Receiving centre has usually to be located at the edge of the town. As a result of observations carried out in different parts of Delhi it was decided to locate the Receiving centre at the Todapur site (Fig. 1) and the land was taken over on the 1st April 1937.

(ii) Temporary Arrangements for Coronation Relays.

313. It was necessary to have the Receiving centre working by the 1st May 1937 in order to relay the Coronation ceremony which was to be broadcast by the B. B. C. The receiver had already been delivered by the suppliers but the entire network of aerials had to be erected in less than a month. With the co-operation of the Indian Posts and Telegraphs Department the aerials were erected in sufficient time. A tent was put up on the site as a temporary measure and the receiver was installed in it. Temporary mains were run to the tent and land line connections provided from there to the studios. Two days before the Coronation, the receiving centre was in operation and the relays extending over four hours on May 12, and two hours on May 13 were entirely successful.

(iii) Receiving Centre Building.

314. Plans had been prepared for a suitable building to house the Receiving centre. which, owing to its being located at headquarters had also to be a control centre for monitoring the performance of all the stations of A. I. R. Construction was commenced in June 1937 and the building was ready for occupation by November 1937 (Fig. 2). Throughout the rains the relays were conducted from the tent itself, and when the

*The Madras Receiving Centre since came into operation on the 28th December 1939.

building was ready the equipment was transferred with only two days' interruption for changing over feeders, power supply and land line connections.

(iv) Diversity Reception.

315. As the programmes picked up are to be re-broadcast, the effects of fading must be minimised. In most receivers designed for shortwave reception, there is a means of automatic gain control. The incoming signal is utilised to control the gain or amplification of the receiver so that the rectified output is kept sensibly constant. The chief limitation of this method is that when the signal is weak, the gain of the receiver is so high that the background noise generated in the receiver or picked up by the aerial is also amplified to an undesirable extent. But the very fact that fading is of a random nature can be made use of in overcoming it. When the signal is very weak at one point the chances are in favour of its being strong at another point a sufficient distance away. If two spaced aerials are used to pick up the rays, the probability is that at any time one of the two would pick up a good signal. With three such aerials the chances are still further increased. This system known as Space Diversity, is used at Todapur. Experiments here and elsewhere show that a minimum spacing of four wavelengths is necessary to produce satisfactory diversity. The arrangement of the aerials on the site is shown in Fig 3.

316. The signals picked up in the three aerials are in random phase and cannot be combined direct The combination therefore takes place after rectification. The signal picked up by each aerial is fed to a receiver and the audio frequency outputs of the three receivers are combined in the right phase, so that if the same aerial were connected to all the receivers, the audio frequency outputs would add. This alone is not sufficient to produce the desired result, for even if the signal on one receiver were quite strong, it might be weak on another, and this would result in the latter working at maximum gain and contributing a lot of undesired noise to the combined output. In order to ensure that at any time the aerial picking up the strongest signal contributes the most to the output, the a. g. c. circuits of the three receivers are linked together. Under these circumstances, if one receiver is getting a strong signal the gain control voltage developed in that receiver is applied to the other two, thereby effectively suppressing their audio frequency output. When the signal weakens on that receiver, one of the others automatically takes charge. The extent to which the system can overcome general fading can be seen in Fig. 4. This is a record of a g c. voltage variations when receiving a transmission from Daventry on 17,790 kc|s. with one, two and three receivers interlocked as described and connected to spaced aerials.

(v) Shortwave Aerials.

317. Experiments at Delhi have shown that a certain amount of directivity in the aerial system is necessary in order to overcome the high level of atmospheric noise. Where land is not very costly the aerial which gives the maximum amount of directivity per rupee of investment is the Bruce horizontal rhombic. Since, in addition, this aerial is effective over a wide range of wavelengths, it has been adopted as the standard. Two rhombic aerials are normally used, in conjunction with a third aerial which,

depending upon the conditions at the time, may be a horizontal doublet, an inverted V or a vertical aerial. These three aerial systems are well spaced and feeders are taken to the receiver. The aerials are carried on multisection tubular poles of the built-up type and open feeders are run on similar poles of lower height.

(vi) Description of Receiving Equipment.

318. The receiving equipment used is of a special type developed for the purpose. Four receivers are mounted on a rack, and normally three are used for a relay while the fourth is kept as a standby, tuned where possible to another transmitter radiating the same programme. The rack contains necessary facilities for all operations such as locking the a. g. c. lines of two, three or four receivers in one or two circuits. Similarly the outputs of the receivers may be combined to feed one or two programmes to the outgoing lines Provision is made for controlling the voltage of the incoming A. C. supply for monitoring the output from any one of the receivers on a loudspeaker or headphones and for checking the quality and signal level of outgoing programmes (Fig. 5).

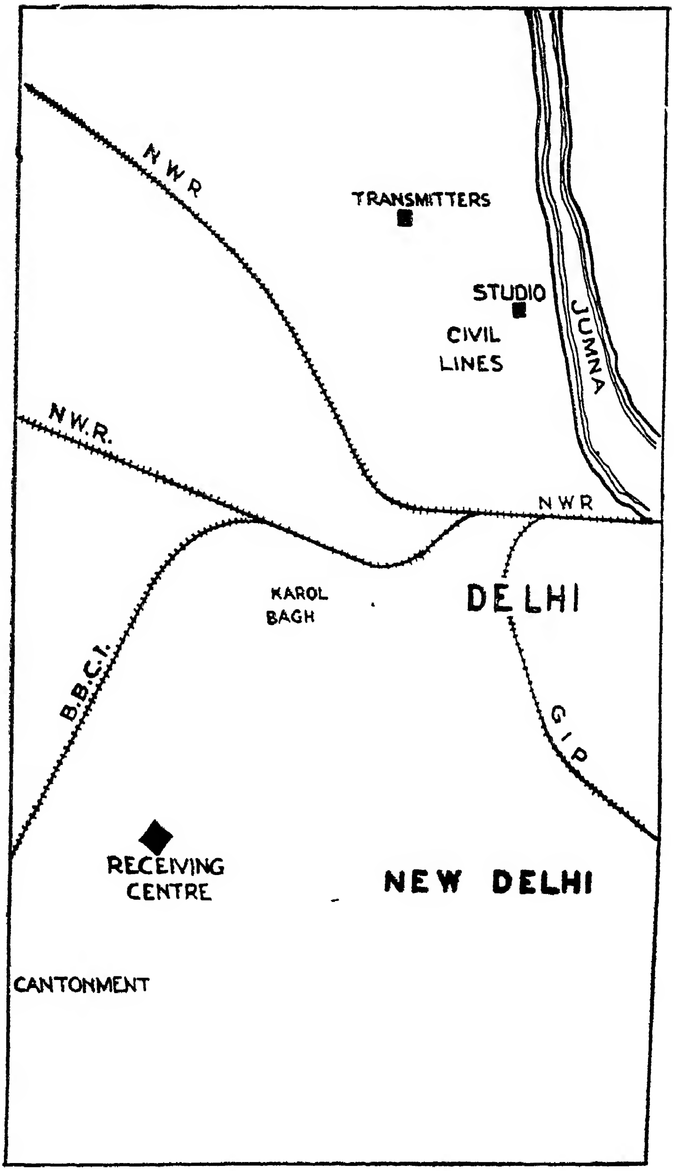
319. The individual receivers in the panel have several special design features. They operate on the superheterodyne principle, each receiver with its own beating oscillator, so that it can, if desired, be tuned to a different frequency from the others. To avoid mutual interference between the beating oscillators when more than one receiver is tuned to the same frequency, the i. f. stages of the four receivers are adjusted to have mid-band frequencies of 430, 445, 460 and 475 kc|s. (In the newer receivers the separation has been increased to 20 kc|s). Two stages of r. f. amplification are used on the shorter wavebands to increase the image selectivity. Separate rectification is used for a.g.c. and audio frequency output. The beating oscillator, though tuned by the same ganged control as the signal frequency circuits, is provided with a separate vernier adjustment in order that tracking errors or frequency drift in the oscillator can be corrected easily. In diversity reception it is often necessary to alter the sensitivity of one or more receivers to compensate for the different gains of the aerials and receivers at the frequency in use or to suit various reception conditions. A control is therefore provided on each receiver to vary its i f. gain over a wide range. In the newer receivers an additional control is being provided for cutting out the a.g.c. to meet unusual reception conditions such as certain types of flutter fading. A further refinement would be a control for selecting the most suitable a.g.c. time-constant for the fading conditions prevailing at the time. Use is made of the audio frequency gain control to balance the receiver outputs and avoid perceptible change in level when one receiver takes over from another. The tone-control on the older equipment is being supplemented by a fidelity control on the new equipments, the band-width of the i.f. transformers being continuously variable.

320. The underground cable which carry the programme to the Delhi studios are approximately 12 miles long and consequently the quality of speech and music suffers considerable deterioration in transit. Corrective networks have therefore been installed at both ends of the line to compensate for this to provide an overall frequency response characteristic flat within 2 DB from 30 to 9,000 cycles per second.

321. In addition to relays from the B.B.C., special re-broadcasts have been carried out of programmes from the League of Nations. There was also the Third International World Concert when most of the broadcasting organizations of the world relayed a programme from the Netherland Indies. Special directional aerials pointed towards Java were erected for the occasion and the relay from Delhi was among the best that any country achieved. The aerial system is at present being expanded to cover the different Indian stations which have recently been erected.

322. In addition to its functions as a Receiving centre, the Todapur station serves also as a control centre where a watch is kept on all A I.R. stations. Periodical checks are made of the wavelength, field strength and quality of the transmissions. Some of the work of the Research Department is also carried on there owing to the freedom of the site from electrical interference, such as atmospheric measurements and observations on the down-coming angle of shortwave transmissions.

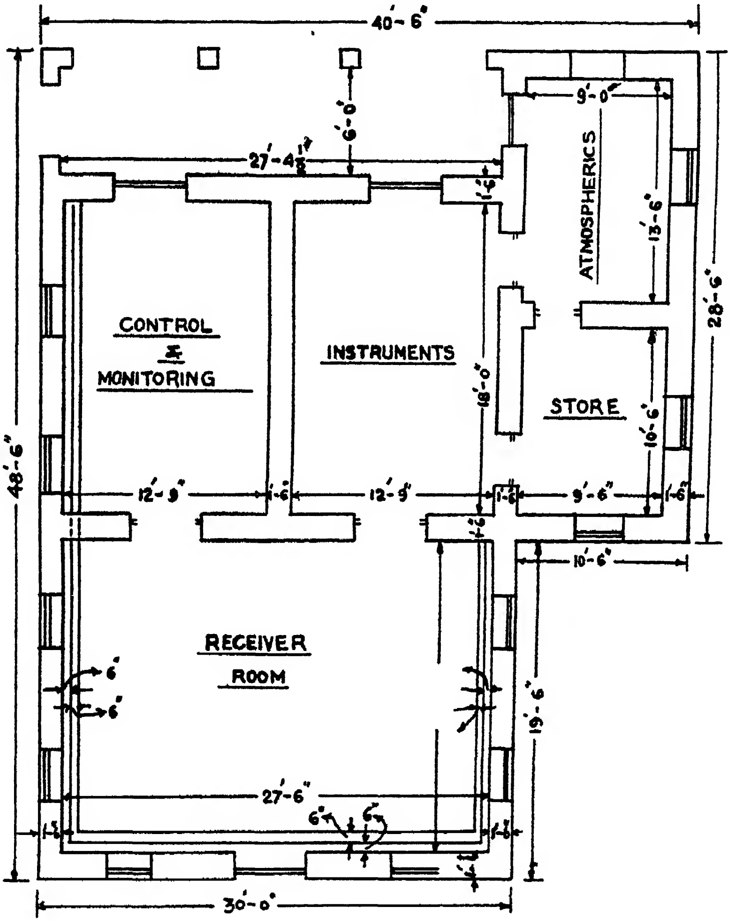
SITE FOR RECEIVING CENTRE
DELHI



RESEARCH AIR DEPARTMENT

FIG. 1

BUILDING PLAN FOR RECEIVING CENTRE DELHI



RESEARCH AIR DEPARTMENT

FIG. 2

LAY-OUT OF AERIALS

TODAPUR RECEIVING CENTRE

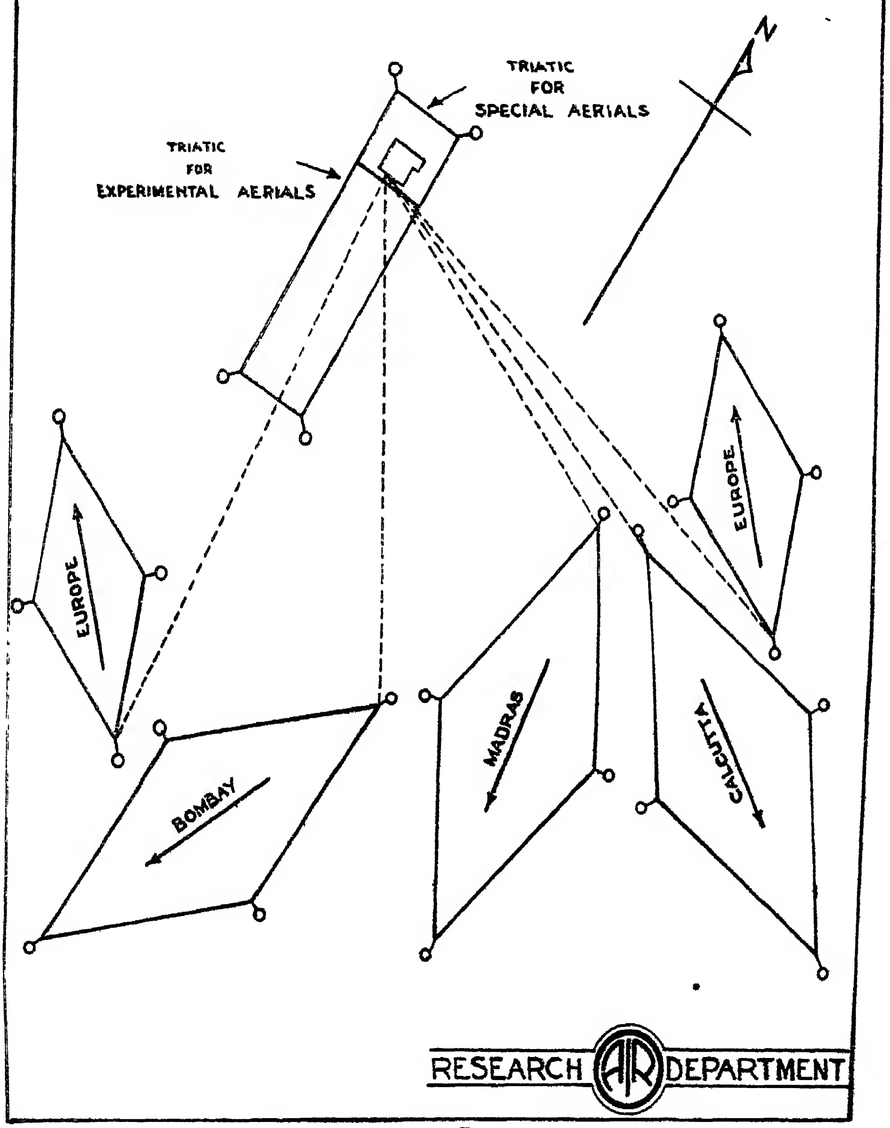


FIG. 3

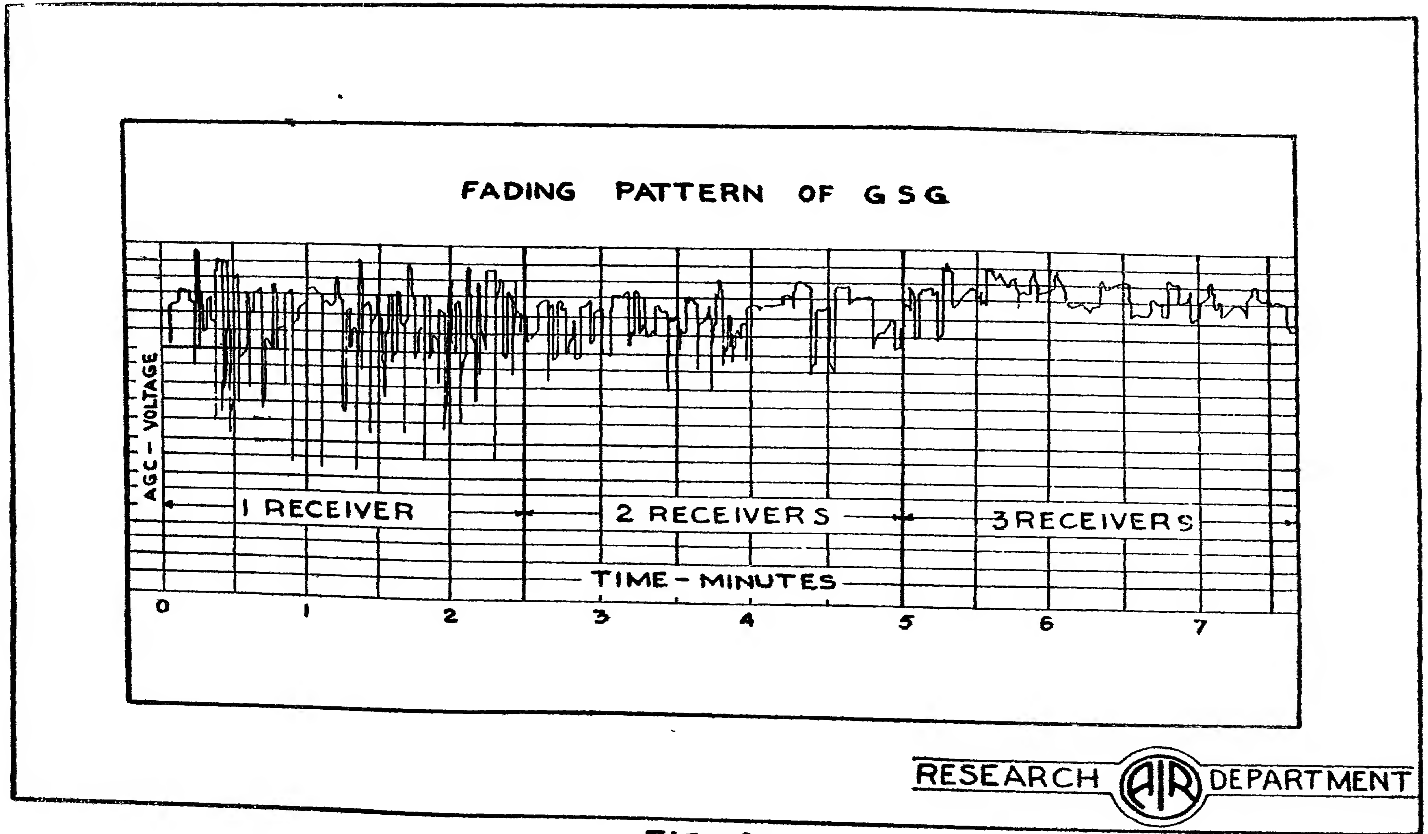

FADING PATTERN OF GSG
AGC - VOLTAGE
1 RECEIVER
2 RECEIVERS
3 RECEIVERS
TIME - MINUTES
0
1
2
3
4
5
6
7
RESEARCH
AIR
DEPARTMENT

FIG. 4

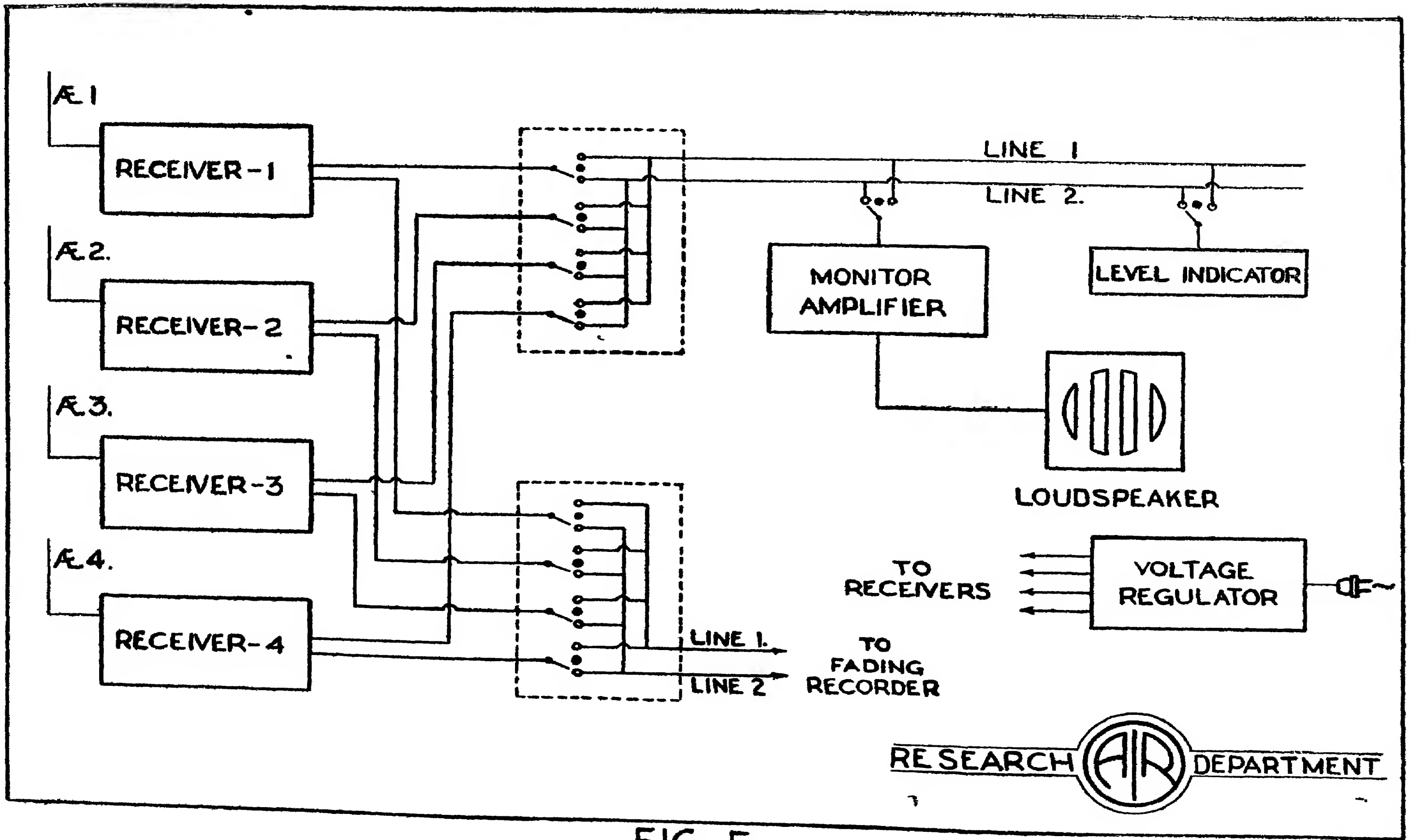

Æ.1
Æ.2.
Æ.3.
Æ.4.
RECEIVER-1
RECEIVER-2
RECEIVER-3
RECEIVER-4
LINE 1
LINE 2.
MONITOR AMPLIFIER
LEVEL INDICATOR
LOUDSPEAKER
LINE 1.
LINE 2
TO FADING RECORDER
TO RECEIVERS
VOLTAGE REGULATOR
RESEARCH DEPARTMENT

FIG. 5

SECTION 9.

The Village Receiver.

323. The number of people who can benefit by a broadcasting service is limited by two factors, the nature of coverage provided, and the cost of receivers with reference to the purchasing power of the population. With the limited funds now available it has been possible to provide for a handful of towns and their suburbs a service which can be picked up even with a cheap receiver. Elsewhere the service is mainly by the indirect ray, and if year-round reception is desired the receiver must be one of the short-wave type. Such a receiver is by no means cheap and even the simpler varieties cost a hundred rupees or more. But not more than one per cent. of the population can be reached in this manner, because the rest cannot afford to buy any radio set, however reasonable its cost might be. The only solution to this economic obstacle appears to be the community receiver. The bulk of India's population lives in villages, and receivers have to be provided from public funds if the villager is to benefit by the service.

324. Under the Government of India Act of 1935, education and rural uplift are provincial subjects. But even before the Act came into force, some Provinces had taken steps to utilise broadcasting for these two purposes. The Government of Bengal had undertaken to install fourteen receivers in the Midnapore District, suitable programmes being provided by the Calcutta Station of All India Radio. The North-West Frontier Province had obtained a small transmitter and installed fourteen receivers within its range. The Punjab had provided a sum of Rs. 48,040 for meeting the capital and running costs of fifteen receivers located in the districts adjoining Delhi, as well as the additional cost of providing special programmes for the villagers.

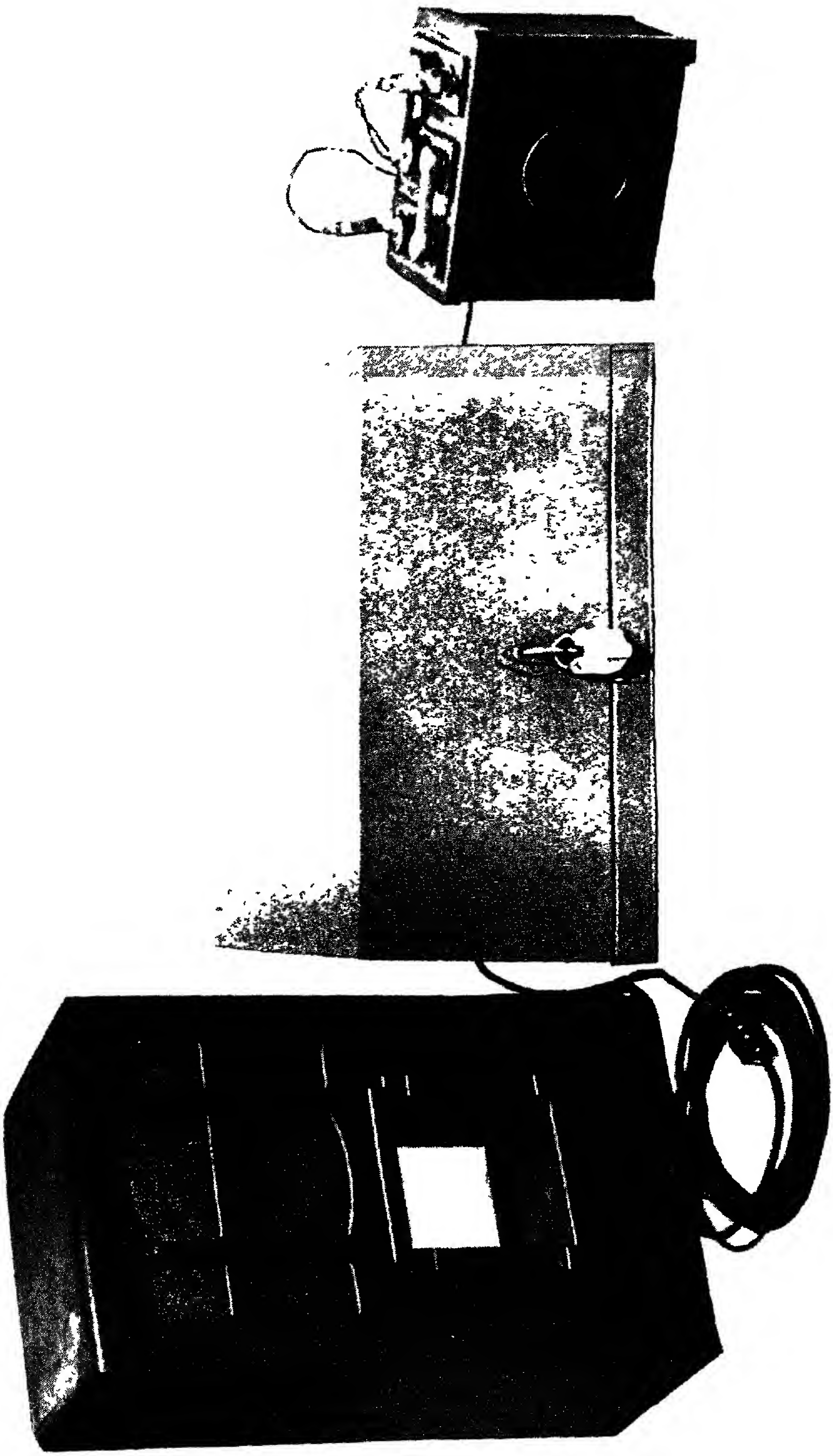
325. A number of difficulties were met with in the earlier stages of these schemes, all of which were sooner or later brought under the technical supervision of A. I. R., as it was felt that many of these troubles could have been solved or avoided by adequate study of the technical points involved in such services. When the Research Department was brought into being in May 1936, it took over the technical management of the Punjab scheme, which was then at its start and which also had its headquarters at Delhi. Five receivers had been installed and the number was gradually extended to fourteen. These receivers were located in villages selected by the Punjab Government, in the districts of Gurgaon, Panipat, Karnal and Rohtak. The farthest was sixty miles from Delhi and a single visit for changing all the batteries involved a journey of 120 miles. It was found, however, that the villages had to be visited for other reasons also. Receivers failed quite frequently, and few days passed without a postcard from one village or another calling for technical attention. Many of the faults were trivial and the actual cost of the needed repairs was negligible compared to the cost of visiting the place. The obvious need was for receivers which would work more reliably under the trying conditions of service. Another point which stood out was the high current consumption of the receivers in use. It was necessary to use either high capacity batteries which cost more than the already expensive receivers, or to change the batteries every ten days which was equally uneconomical.

326. Experiments were therefore started in September 1936 by the Research Department covering various questions such as power supply, acoustic output, stability and design requirements, efficiency and so forth. Seven experimental models of receivers were installed in nearby villages and much experience and information was gained. Based on these and on laboratory tests, a tentative specification was drawn up in June 1937 and circulated to suppliers. But in the absence of a large and assured market they were reluctant to engage in the production of a special model, while not one of the types which they could normally supply was suitable for use straightaway. Some provincial Governments were however ready to make a beginning with village broadcasting, and receivers were urgently needed. The solution was to obtain receivers which came nearest to the specifications and to modify them wherever necessary. Eighteen such modified receivers were supplied to the Government of Bombay in March 1937 and twenty receivers were supplied to the U. P. for installation at tube-wells in the electrified area. Recently sixteen battery receivers were prepared and sent to the Madras Government along with six receivers for A. C. mains operation In the latter case, owing to the fact that power is available, the design of the receiver or its upkeep does not present as many difficulties as in battery operation

327. In the general design of the receivers, consideration has also to be given to certain points which are more economic than technical. For two reasons, the design must follow in outline the models commonly available. When manufacturers are prepared to adopt our design, there should be a minimum of deviation from standard production so that it is not necessary to lay down special plant or alter factory processes. On the other hand if manufacturers will not undertake to make these receivers, it should be possible to alter their standard models to conform to our requirements. The recommended design is therefore of the superheterodyne type with automatic gain control. A straight receiver would perhaps be basically cheaper, but at present it is not being produced in sufficiently large numbers to be generally available at a reasonable price. Some of the reasons for its unpopularity are its generally lower sensitivity and selectivity, the difficulty of tuning owing to the necessity for reaction, and the variation in gain with change in battery voltages. From the experience with the Punjab scheme, it was found, that the last is a serious drawback in the case of village receivers which have to work unattended, and attention has been concentrated on the superheterodyne type.

328. A schematic diagram of the recommended design is given in Fig. 1. The circuit is entirely straightforward and should be quite simple to assemble or service. In the diagram, coils have been shown for only one wave-band, but the receiver covers all the broadcasting bands in use in India. The inclusion of the shortwave-band increases the original cost by a few rupees, but it multiplies a hundred-fold the area where receivers could be installed.

329. The valves have been chosen for economy, low cost and easy availability. Those used in the mixer and I. F. stages are of the directly-heated type, as indirectly-heated valves showed a greater frequency drift when warming up. In the other stages, the indirectly-heated valves give a freedom from hum due to the high tension generator. The H. T. and L. T. voltages are adjusted to suit the different valves and to give economy in operation. The I. F. transformers are of the iron-cored type in which



adjustments are made by a sliding core. Experience shows that in conjunction with fixed condensers for tuning, these provide better stability than is obtainable with trimming condensers of the usual type. The grid and oscillator coils for mediumwaves could also be of the same construction. In the shortwave coils special attention has been paid to stability with temperature and vibration, while the associated condensers are of a sealed type which minimise the drift due to change in the dielectric constant of the material with temperature and humidity.

330. A six-volt car type accumulator is used to supply the power for working the receiver. Such accumulators are produced in large numbers and are the most economical media in which power can be stored. During the experiments, several receivers were run for a period of six months on primary batteries, but the output of the receiver was limited while the cost of upkeep was high Primary battery operation is therefore not recommended, except where it is not possible to visit the set periodically and change accumulators owing to the inaccessibility of the site.

331. The high tension power supply is derived from the accumulator by means of a vibrator. The vibrator interrupts the current in the primary of a transformer and an auxiliary pair of contacts on the reed rectifies the A. C. voltage from the secondary. A rotary converter was used in earlier models with satisfactory results, but the vibrator has a slightly higher efficiency and can work for long periods without attention. A certain amount of R. F. interference is created, but this is suppressed by proper filters in all leads. There is also a ripple induced in the L. T. supply but this is inaudible with the valves used and the noise level, unweighed, is about 60 DB below peak output. The original vibrators which appeared on the market were not as good as rotary converters, but at present several models have been tried which have stood up to severe tests. Owing to the fact that the output stage operates Class " B ", it is necessary for the power unit to have good regulation. Comparative curves of efficiency and regulation of different rotary converters and vibrators are shown in **Fig. 2.**

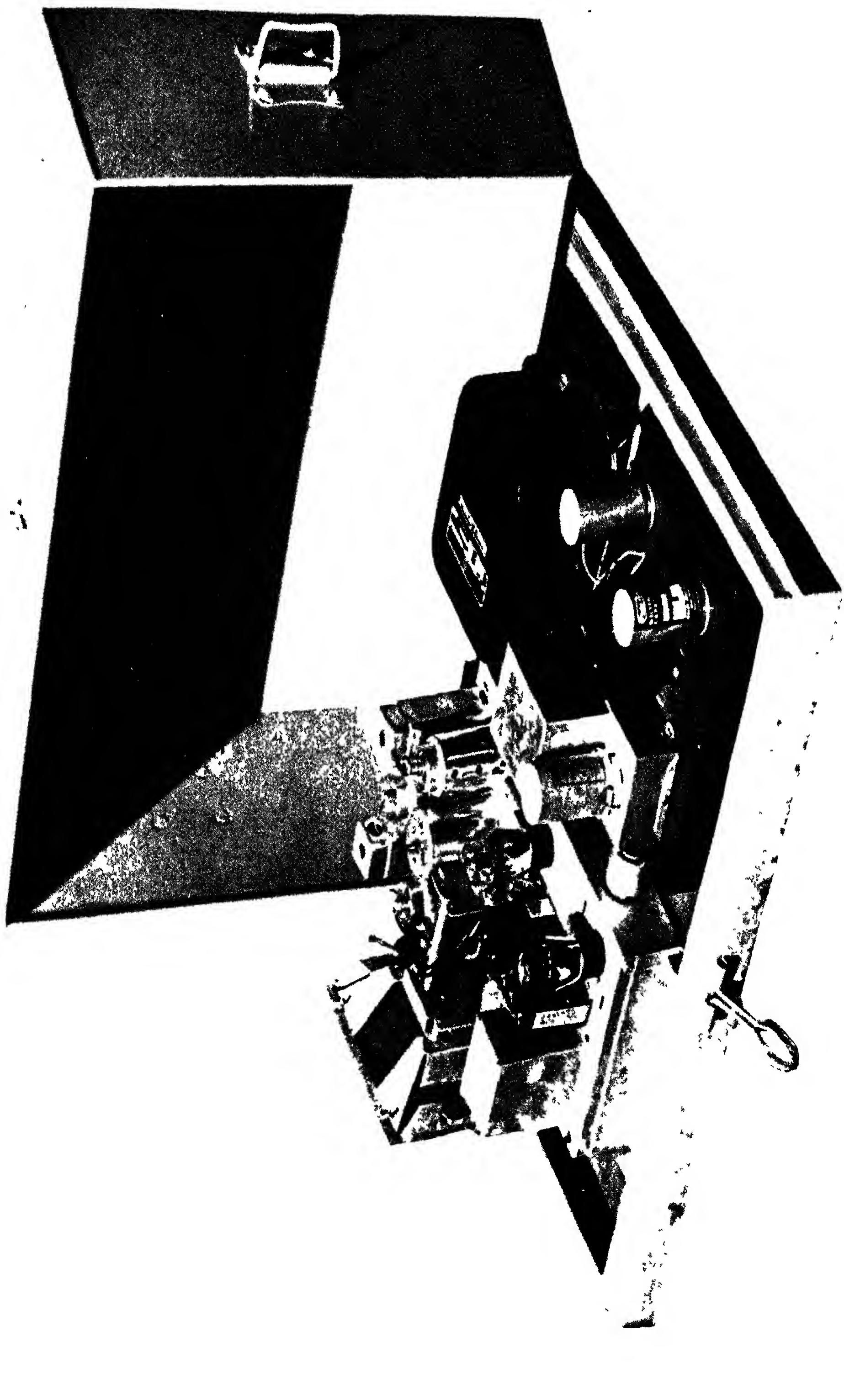
332. The receiver is designed for a maximum output of about three watts electrical energy fed to the loudspeaker. Once the novelty has worn off, audiences do not exceed two hundred in the average village, and higher outputs are not necessary. For comparison it may be stated that the output from a battery receiver designed for household use is of the order of 1 watt, while some of the special types tried out had outputs of up to 5 watts.

333. Next to reliability, the main requirement in a village receiver is economy. Receivers which are wasteful of current are expensive to maintain. as larger batteries or more frequent renewals become necessary. An overall efficiency of 14 per cent. between audio frequency input to loudspeaker and power consumption from the accumulator has been reached in the latest designs. The features which have been adopted for this purpose are the use of low-consumption valves in all the stages and the use of Class " B " output stage which permits high efficiency in power amplification. The aim has been to get the desired output with the stages working at high efficiency Typical test data for various designs of output stages are given in Fig. 3. It will be seen that while the efficiency rises, the harmonic content in the output also increases. The choice of valves and circuit parameters would depend upon the most satisfactory compromise between

the above three in addition to general and economic considerations. Observations here and elsewhere have shown that 5 per cent. of harmonics is not noticed in normal listening and up to 10 per cent. can be permitted on peaks. The audio gain control of the receiver has to be set to give the maximum output of 3 watts at the peaks of modulation. The average level is then about ½ watt and loud passages are rendered at about 1½ watt The output stage is designed so that the harmonics do not exceed 5 per cent. at average levels, 7 per cent on loud passages and 10 per cent on the peaks.

334. The loudspeaker has generally been a source of trouble The choice is practically restricted to the permanent magnet moving coil type. During the monsoon, the voice coils and cones usually get distorted in shape, but it has been possible to reduce this trouble by the use of suitably impregnated cones. Dust particles get into the movement and it is necessary to provide protective pads in front and behind. The loudspeaker has to convert the electrical energy supplied by the receiver into acoustic energy. The average moving coil loudspeaker fitted in a plain box or baffle has a very low efficiency and usually 90 per cent. of the energy fed into the loudspeaker is wasted. If this loss is reduced even slightly, say to 80 per cent., the effectiveness of the whole installation is doubled. The same receiver can then be made to serve a larger audience, or alternatively a receiver with lower output can be used instead, with consequent reduction in both capital and running costs. The factors which go to improve the efficiency of the system are the construction of the loudspeaker including magnet, voice-coil and diaphragm, and the air loading provided on the diaphragm which is analogous to the radiation resistance of an aerial. One of the main improvements in loudspeakers has been the use of new alloys for magnets which have made possible flux densities from 7,000 to 12,000 lines per sq. cm. The electrical energy having been converted into motion of the diaphragm, it is necessary to have a suitable device to couple the light medium, air, to the relatively heavy diaphragm A horn is used for this purpose. In addition to providing a load and thereby increasing the efficiency, it has also the effect of confining the radiation of sound to a narrow angle Several different types of horns have been tried but so far none have proved quite satisfactory. Tests in this connection are still in progress and typical figures are given in Fig. 4 for various types. The aim is to produce a mounting which would provide the proper acoustic loading to the front and back of the cone and the fact that the mounting has to be practically weather-proof complicates the design Reducing the diameter of the cone would eliminate the difficulties in loading the back, but the necessary increase in length of the horn makes the cost very high. It is hoped that a suitable design could be evolved to fit the average eight-inch cone and cover a wide angle with good efficiency.

335. To keep out dust and insects, the whole receiver is enclosed in a box of sheet metal finished in cellulose paint. This has the additional advantage that the tuning is not upset by accident or mischief. Wooden boxes were used at first but it was found that owing to the heat generated in working, the components were subjected to a very high temperature at the end of an hour. A time-switch is also fitted inside the box to switch the receiver on and off at pre-set hours. This was necessary because in some villages the receivers were used for longer hours than intended, with



the result that the battery had run down long before battery-replacement was due, while in other cases the villagers missed portions of the programme because the receiver was not switched on in time Wherever time-switches have been provided they have added to the general reliability of the service.

336. The batteries have to be recharged at regular intervals, depending upon the size of the battery and the number of hours the receiver is in use every day. The original receivers installed for the village schemes required two large batteries, while the present types can run with one medium-sized battery for a month on the basis of one hour a day. At the end of the month the discharged battery has to be removed and a charged battery put in its place The most convenient arrangement is to have a charging plant in the middle of a group of ten or twenty villages, with a sufficient number of spare batteries and a mechanic to look after the plant. If the charging centre is located in a town with electric supply, the necessary plant can be run from the mains. Otherwise use is made of any one of a number of small petrol-driven generating outfits available on the market. Some experiments were made at Delhi with generators driven by manual power, but the results were not satisfactory. The effort required to charge a battery is considerable and even with paid labour the success of such a scheme is doubtful. .Wind power was also tried but did not prove sufficiently reliable at Delhi, though there may be several districts in which it might be quite satisfactory. For about an equal investment it would be possible to obtain a petrol generator or A. C. mains charger of about 100 watts capacity, a wind generator of a possible 30 watts capacity or a manually operated one of 20 watts capacity. Petrol generators are available in various sizes and the choice would depend on the number of villages to be served from the centre. Some conveyance arrangements have to be made for the transport of the batteries and the mechanic to and from the different villages.

337. The modified receivers supplied to provincial governments are of the general type described above, subject to minor limitations due to the original receiver itself. The success of a scheme for village receivers depends on efficiency and economy. It has not been difficult to give these aspects full weight in the technical design and choice of equipment, but there is a great necessity for scientific planning in the operation of the service A scheme is in progress for the installation of 120 receivers in the Delhi province. The sets, which are standard models, specially modified at the Research Department, were prepared, and installation commenced in September 1938. The full possibilities of village broadcasting are being tried in a thorough manner and it is hoped that the scheme will not merely yield valuable results but will also prove a good training ground for representatives of provincial governments.

SCHEMATIC DIAGRAM FOR VILLAGE RECEIVER

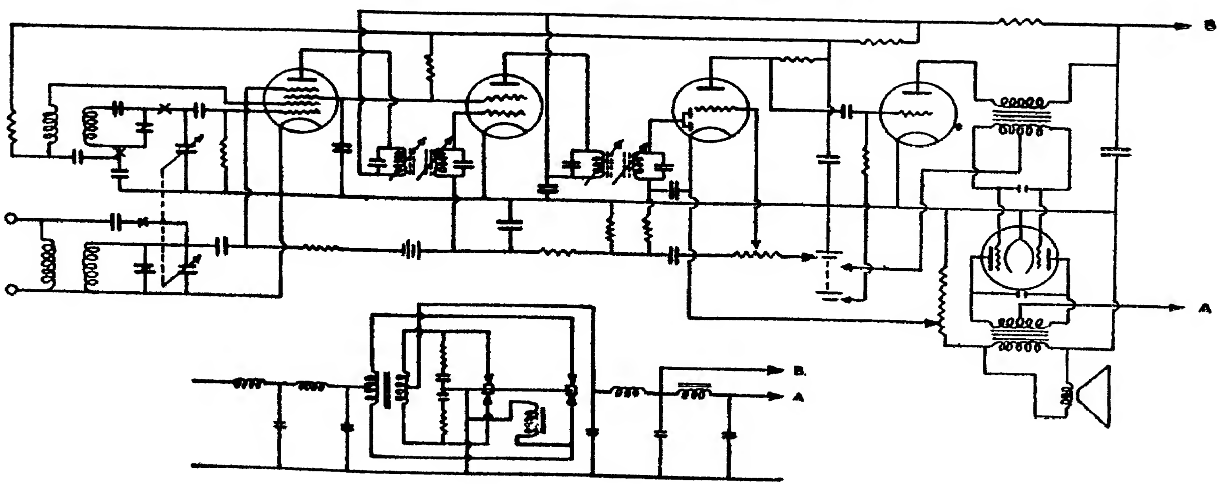


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FIG. 1

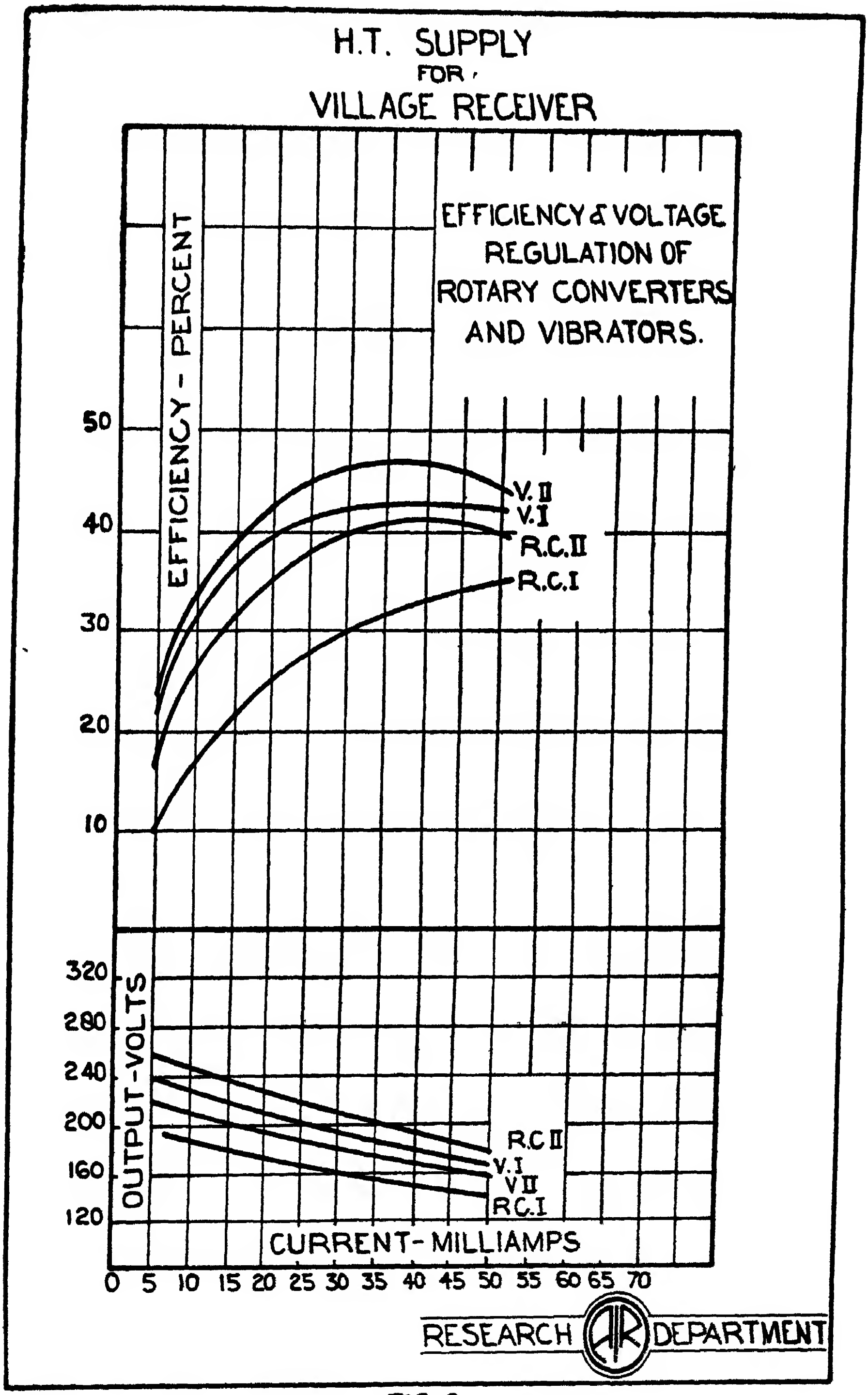
H.T. SUPPLY
FOR
VILLAGE RECEIVER
EFFICIENCY & VOLTAGE REGULATION OF ROTARY CONVERTERS AND VIBRATORS.
EFFICIENCY - PERCENT
50
40
30
20
10
V.II
V.I
R.C.II
R.C.I
OUTPUT-VOLTS
320
280
240
200
160
120
R.C II
V.I
V II
R.C.I
CURRENT-MILLIAMPS
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
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FIG.2

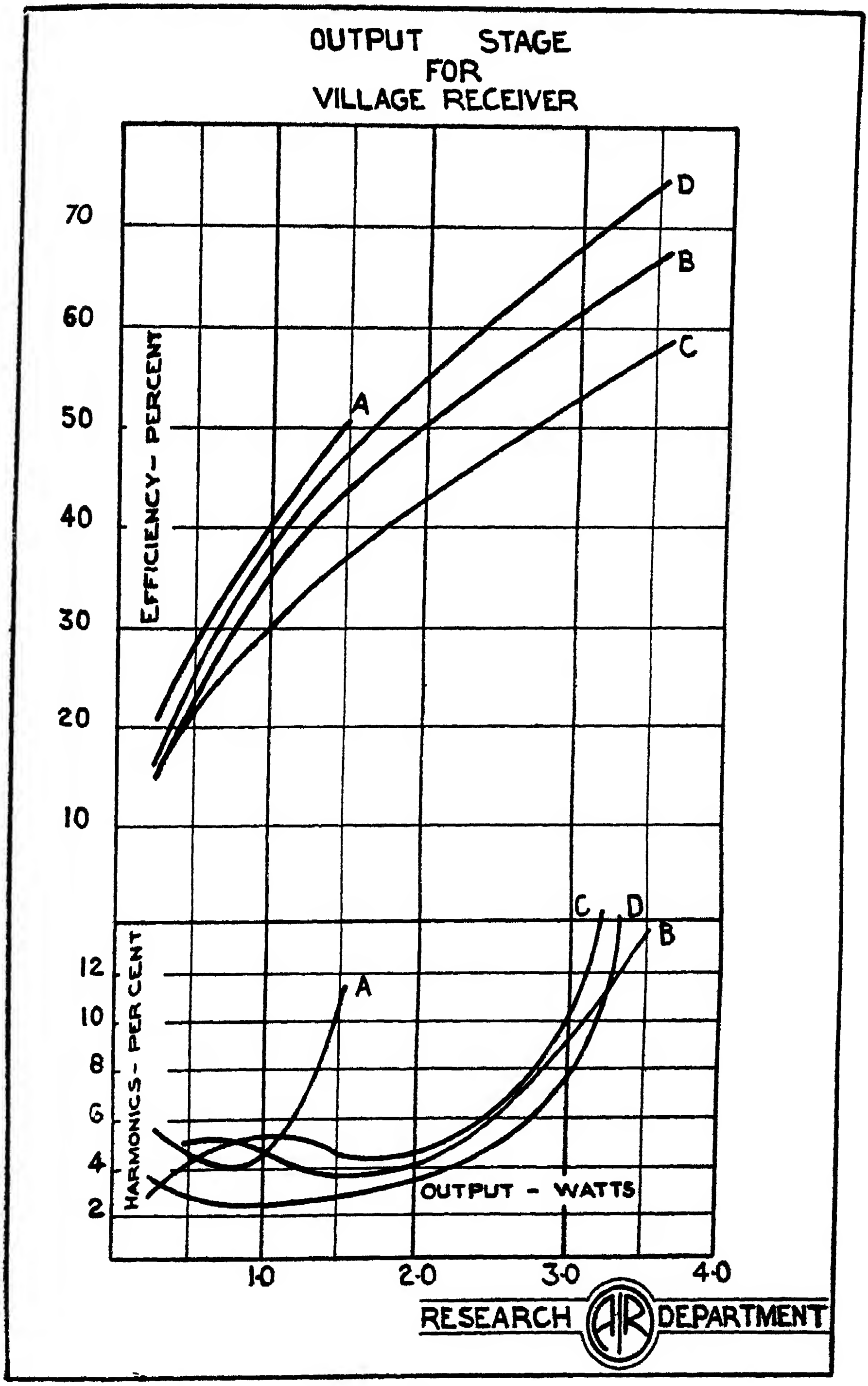
OUTPUT STAGE
FOR
VILLAGE RECEIVER
EFFICIENCY - PERCENT
70
60
50
40
30
20
10
A
B
C
D
HARMONICS - PER CENT
12
10
8
6
4
2
OUTPUT - WATTS
1·0
2·0
3·0
4·0
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FIG.3

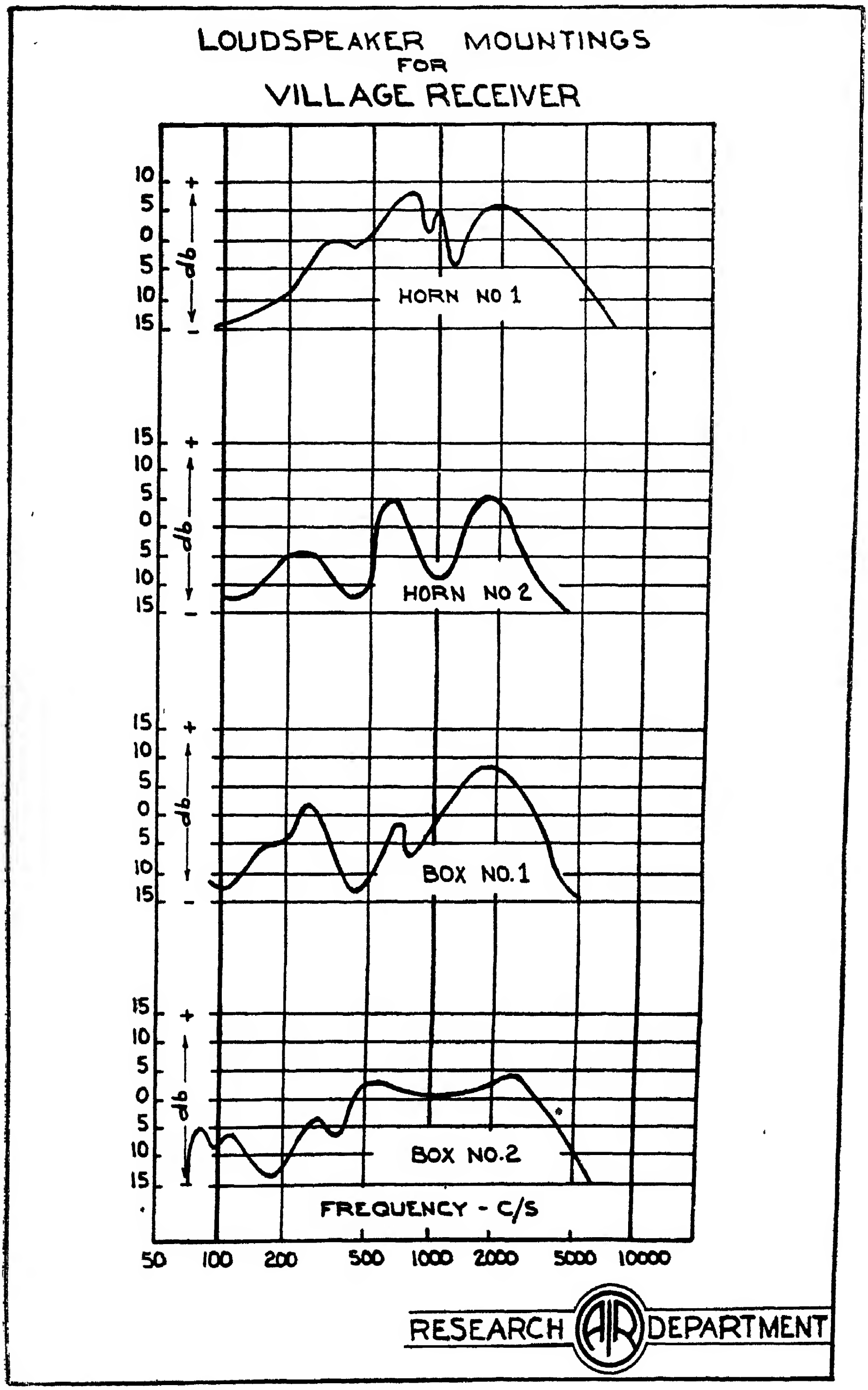

LOUDSPEAKER MOUNTINGS
FOR
VILLAGE RECEIVER
10
5
0
5
10
15
db
+
-
HORN NO 1
15
10
5
0
5
10
15
db
HORN NO 2
15
10
5
0
5
10
15
db
BOX NO.1
15
10
5
0
5
10
15
db
BOX NO.2
FREQUENCY - C/S
50
100
200
500
1000
2000
5000
10000
RESEARCH
AIR
DEPARTMENT

FIG. 4

CHAPTER VI.

ADMINISTRATION.

CHAPTER VI.

ADMINISTRATION.

SECTION 1.

Budget.

(i) Recurring expenditure.

338. An account of the financial position of the Indian State Broadcasting Service at the time the Government of India took over the organisation under its direct control on the 1st April 1930 has been given briefly in Chapter I. The following paragraphs deal with the budget and accounts since that date.

339. The chief sources of revenue are (1) Customs duty on wireless apparatus, (2) Licence fees, and (3) Subscriptions and Advertisement revenue from Radio journals

340. *Customs Duty.*—When wireless receiving apparatus first began to be imported into India the specially low rate of duty of 2½ per cent. *ad valorem* was imposed to encourage the growth of broadcasting. When the Indian Broadcasting Company began operations in 1927 it was allowed to collect a ' tribute ' of 10 per cent. *ad valorem* on all imports of wireless receiving apparatus. After the company went into liquidation and when Government instituted the Indian State Broadcasting Service, this 10 per cent. ' Tribute ' was converted into an additional 10 per cent. *ad valorem* customs duty and credited to general revenues, and it was understood that the proceeds would be available for broadcasting. In March 1931 the duty was raised to 20 per cent. and in September of that year to 25 per cent. This, however, was found insufficient and in order to keep broadcasting alive the rate was raised from the 1st April 1932 to 50 per cent. *ad valorem.* (On the passing of the Ottawa Trade Agreement Act this has been reduced to 40 per cent. for British goods.) Up to 1934-35, Broadcasting was credited with the whole of the customs duty levied, less the original 2½ per cent. But under the orders of the Government of India, the receipts from customs duty on wireless apparatus and instruments from the year 1935-36 onwards have been excluded from the income and expenditure statements and shown separately in a foot-note thereto less 2·3 per cent. of the total receipts on account of the cost of collection by the Customs Department.

341. *Licence fees.*—The Posts and Telegraphs Department retain Rs. 2 per licence out of the fee realised for all Broadcast Receiver, Demonstration, Commercial Broadcast Receiver, and fixed station licences issued. Of this amount As. 8 is for the printing, issue, etc., of the licence and the remainder is available for use in connection with inspection and prevention of evasion of licences. The balance of such fees is credited to All India Radio. On Possession licences the Posts and Telegraphs Department retain the whole fee, *viz.,* Rs. 10.

342. *Radio Journals.*—The Profit and Loss account of the Radio Publications is given in Appendix III. It will be seen that up to 1934-35 the Publications ran on the whole at a small profit. Since then, however, there

has been a growing loss on the Radio Journals, owing to the following reasons :

(i) The subscription and advertisement rates (for which long term contracts had been entered into) were not high enough to offset the increased printing charges entailed by the rapid rise in the circulation.

(ii) Unfavourable printing contracts whereby the rates increased with circulation.

(iii) Increasing space was required for accommodating programmes of the new stations and there was a consequent increase in cost of production.

(iv) Unsatisfactory production resulting in loss of advertisement revenue.

The remedial measures taken were—

(i) The subscription of the "Indian Listener" which was at first Rs. 2 per annum was raised to Rs. 3 with effect from January 1936 and to Rs 4 per annum from March 1936. This has now been raised to Rs. 6 per annum from the 1st March 1939 in view of the 100 per cent. increase in size.

(ii) The " Indian Listener " which was at first printed at Bombay was shifted to Delhi in August 1937 where it was possible to procure a cheaper contract.

(iii) The scope of the advertisements (which were at first restricted to Radio goods only) was enlarged.

(iv) The layout was improved by inserting programmes in 4 columns to a page instead of three. The printing was improved by a change of printers and by inviting fresh tenders for a long term contract The rates are now reduced still further.

(v) The bilingual ' Awaz ' was split up into two separate editions--Urdu and Hindi—with effect from the 1st July 1938 which eliminated duplication. It has also been decided to use news print paper, which will further reduce the cost. The subscription was raised from Rs. 2 to Rs. 3 per annum.

(vi) Improved measures were adopted to stimulate advertisement revenue.

343. Under the orders of the Government of India, individual stations of All India Radio and the Radio publications are treated as commercial concerns in their relations with other departments and for the compilation of *pro forma* accounts, while the office of the Controller of Broadcasting and the Research Department of All India Radio are treated as ' service ' Departments. In the *pro forma* accounts of All India Radio, one-half of the expenditure of the office of the Controller of Broadcasting is debited to the stations of All India Radio and the Radio Publications. A moiety of the cost of the Research Department is similarly distributed over the All India Radio stations.

344. Up to 1936-37 the distribution of Headquarters charges between the All India Radio stations and the Radio Publications was made in the proportion of 4 : 1. In view of the increase in the number of stations this proportion has, in consultation with the Accountant General, Central Revenues, been revised to 8 : 1 with effect from the accounts for 1937-38. The

income and expenditure account of the Department from the year 1930-31 onwards is given in Appendix IV. The total income and expenditure of the Department since its inception is as below :

		Rs.
Total income (including Customs Revenue) from 1930-31 to 1938-39	..	1,00,44,798
Total expenditure during the same period	..	77,44,848
Net Gain	..	22,99,950

A Note on the Cost of Programmes.

345. Some remarks might be usefully added here on programme expenditure which is the major item of expenditure at broadcasting stations. A statement showing the amounts spent under this head from the year 1930-31 to 1938-39 is given below :

Year.	Expenditure on Programmes.	Average expenditure per day.	Average programme hours per day.	Average expenditure per programme hour.
	Rs.	Rs.		Rs.
1930-31	80,469	220	13	17
1931-32	74,262	203	13	16
1932-33	72,231	198	13	15
1933-34	82,194	225	13	17
1934-35	1,06,425	292	14	20
1935-36	1,48,368	406	20	20
1936-37	3,34,964	918	25	36
1937-38	4,17,125	1,143	38	30
1938-39	6,36,142	1,743	51	34

The average programme hours per day are taken for the whole of the service. Up to 1933-34 Calcutta and Bombay were broadcasting for roughly 6½ hours per day. In 1935-36 this was raised to 7½ hours each with Delhi accounting for another 5. By next year Delhi went up to 9 hours a day and Calcutta and Bombay to 8 hours. In 1937-38 came Lahore and Peshawar with 5 to 6 hours per day each and in 1938-39, Lucknow and Madras added another 10 hours During this year the shortwave stations at Bombay, Calcutta, Delhi and Madras began to radiate alternative programmes which added roughly an hour per day to the daily programme hours of each of these stations

346. It will be seen from the above statement that although the funds available for programmes have been increased during recent years, Rs. 30 to Rs. 35 an hour, which is the level reached at present, is an extremely inadequate figure An average talk lasting for 15 minutes may cost anything from Rs. 15 to Rs. 30 and obviously even this sum will not attract many good talkers in the country. A play lasting an hour involves author's royalty (Rs 20 to Rs 100) and payment to a cast of 5 to 10 actors who must be engaged at least for a week for proper rehearsal prior

to final production. Three to four Indian musicians must be engaged everyday to provide a modicum of variety, their fees ranging from Rs. 20 to Rs. 300 per artist. A European orchestra which fills an hour or so, may cost anything from Rs. 50 to Rs. 150. Indian orchestras have to be maintained at all stations for accompaniments, rehearsals and for performance. Such orchestras consist of 8 to 15 instrumentalists and cost on the average Rs. 500 to Rs. 1,000 a month or Rs. 17 to Rs. 34 a day A rural hour consisting of 2 to 3 musicians and about 6 brief talks costs roughly about Rs. 25 which has frequently been found to be extremely inadequate.

347. On the basis of about Rs 35 per hour, stations broadcasting for about 5 hours a day should be allotted Rs 175 per day and those broadcasting for 10 hours, Rs. 350. In actual practice, during 1938-39 the daily programme allotment of the various stations ranged from Rs 150 to Rs. 350, as the purchasing power of the programme allotment varies appreciably from area to area. At Calcutta for example there is a widespread enthusiasm for music and a large number of non-professional artists who do not demand high fees. At Bombay, which is an important film centre, there is a keen competition for securing the services of artists, and fees tend to rise higher. The cost of an item again depends very often on its scope and the resourcefulness of the staff. A short single item of outstanding attraction, importance or publicity value may cost as much as a dozen humdrum items, each of the same duration and may be ultimately more than a dozen times as useful. Such items depend on opportunity and the capacity to make prompt use of it and since neither of these is a constant factor, nicely apportioned funds are liable to constant and sudden revision and re-distribution.

348. The following statement is designed to give a very rough idea of how the daily programme allotment of a major station of All India Radio is distributed amongst the various items .

H. M.		Rs.
1 0	Village Hour	20
0 45	Talks (3)	65
4 0	Indian Artists (3)	100
1 0	European Programme	65
1 0	Play	45
0 35	Indian Orchestra	20
	Monthly-paid staff for production and performance ..	15
0 10	Feature programmes and outside broadcasts	10
0 30	School broadcasts	10
0 30	News .. .. } Expenditure met from other heads	..
1 0	Gramophone records. }	
10 30		350

The distribution of course varies from day to day. No major station for example gives a play every day or restricts itself to three Indian artists or three talks only. But this statement would serve its purpose if it helps to show, firstly, the inadequacy of programme funds and, secondly, the extreme difficulty if not the impossibility of working satisfactorily to an unchangeable allotted figure, which cannot but hinder and obstruct programme activity.

349. In considering these difficulties it must, of course, be remembered that the number of listeners in India, and consequently the revenue obtained through broadcasting is very limited compared to corresponding numbers and revenues in western countries, and the choice therefore lies between a heavy subsidy from the Government of India at the expense of other interests and a gradual development on the basis of revenues which must, for a time at least, place the service at a disadvantage in comparison with richer broadcasting organisations elsewhere.

(ii) Capital Expenditure.

350. It has been explained in Chapter II how the special fund of Rs. 40 lakhs was made available to All India Radio for the development of Broadcasting in India. The estimates referred to in that Section were framed before the sites for the Broadcasting Stations were selected, or tenders invited for the supply of apparatus and plant. Consequently they had to be modified to a considerable extent after the sites had been selected, the detailed estimates for the building obtained from the P. W. Ds. concerned—Central or Provincial—and the supply of apparatus and plant ordered. The figures given below show the revised estimates of the works financed from the fund :

	Rs.
1. Delhi 20 K W M.W. Station	3,86,787
2. Peshawar	50,130
3. Lahore 5 K W.M.W. Station	1,93,600
4. Lucknow 5 K.W.M.W. Station (inclusive of expenditure on power supply amounting to Rs 43,300)	2,34,800
5. Trichinopoly 5 K.W.M W. Station	1,92,500
6. Dacca 5 K.W.M.W. Station (inclusive of expenditure on power supply amounting to Rs 40,000)	2,42,300
7 Delhi 10 K.W.S.W. and 5 K W.S.W. Stations ..	3,30,308
8. Bombay 10 K.W.S.W. Station	2,13,800
9 Calcutta 10 K.W.S.W. Station	2,13,600
10. Madras 10 K.W.S.W. and ·25 K.W.M.W. Stations	3,25,900
11. Modifications to the existing M. W. transmitters at Calcutta and Bombay	20,000
12. Speech input equipments, furniture, musical instruments and alterations to Bombay and Calcutta Studios	1,28,000
13. Receiving Centres at Bombay, Calcutta, Madras, Peshawar, Lahore, Lucknow, Trichinopoly, Dacca (at Rs. 15,000 for each centre) ..	1,20,000
14. Receiving Centre at Todapur	45,600
15. Delhi Broadcasting House	8,50,000
16. Bombay Transmitter site	1,58,000

	Rs.
17. Research Equipment	60,000
18. Spare Parts	67,000
19. Air-conditioning of the Bombay Studios ..	38,000
20. Installation Department including expenditure incurred by the P. & T. Wireless Works Division	1,25,000
	39,95,325

351. The total expenditure incurred out of the Fund up to the end of 1938-39 amounted to Rs. 23,88,067 as below :

	Rs.
1935-36	3,93,287
1936-37	1,39,423
1937-38	10,32,377
1938-39	8,22,977
Total ..	23,88,067*
Balance available on 1st April 1939	16,11,933

The distribution of expenditure detailed above is given in Appendix V and a list of works in Appendix VI.

SECTION 2.

Organisation and Staff.

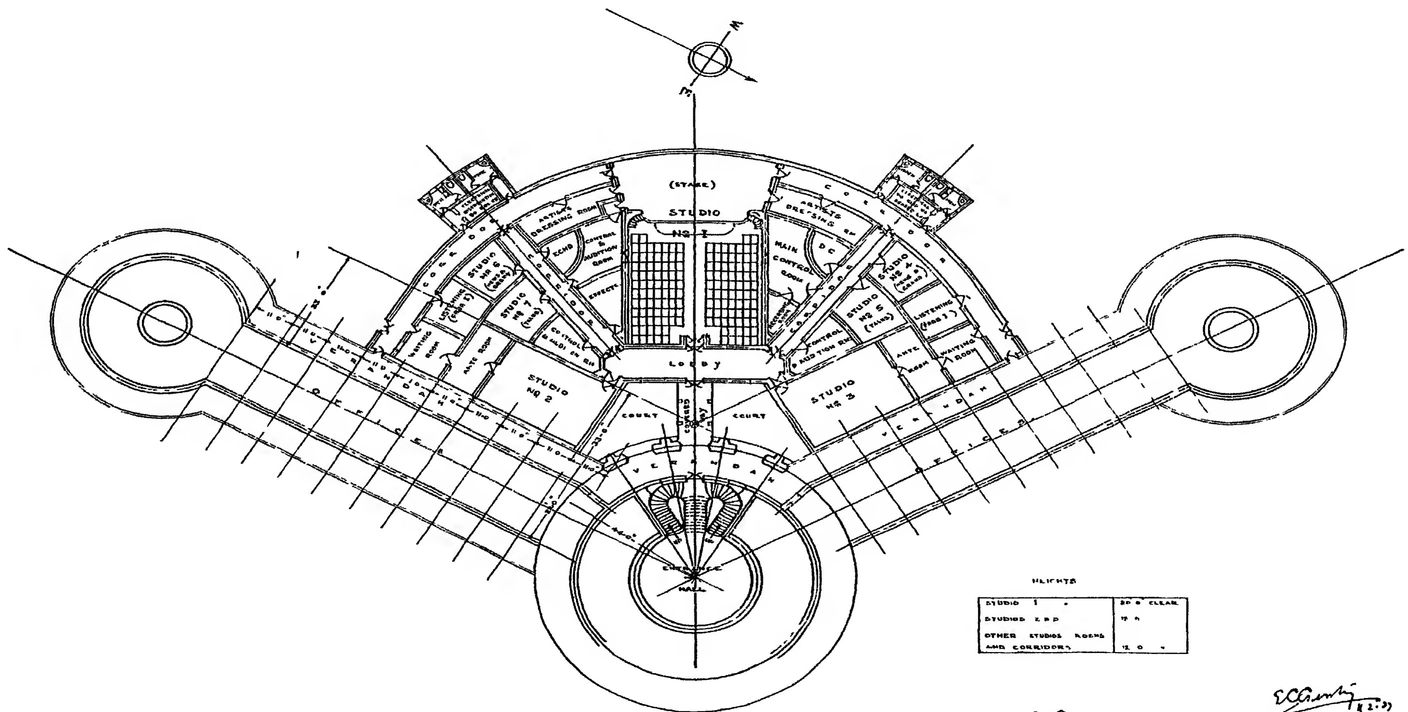
352. On the 1st April 1930, after the liquidation of the Indian Broadcasting Company, broadcasting was placed under the direct control of the Government of India in the Department of Industries and Labour and was put in charge of the Director of Wireless in the Posts and Telegraphs Department. The service was known as the " Indian State Broadcasting Service ", but on the 8th June 1936, this designation was changed to " All India Radio ".

353. In February 1935 a regular attached office to deal with broadcasting was created and pending the appointment of a whole time Controller, Mr. P. J. Edmunds (Director of Wireless) performed the duties of the Controller in addition to his own.

354. Mr. Lionel Fielden was appointed Controller of Broadcasting in August 1935. Originally it was contemplated that he would act both as Controller and as Director of the new station at Delhi, but soon after his arrival it became clear that the duties of the Controller were in themselves far too onerous to make such a double charge possible, and the two posts were separated.

*There is difference of Rs. 3, but the figure given has been accepted.

PROPOSED BROADCASTING STUDIO.
NEW DELHI



HEIGHTS

STUDIO 1	20' 0" CLEAR
STUDIOS 2 & 3	15' 0"
OTHER STUDIOS ROOMS AND CORRIDORS	12' 0"

CONSULTING ARCHITECT
C P W D NEW DELHI

ARCHITECT
C P W D NEW DELHI

355. On taking charge, the Controller was confronted with the task of the re-organisation of the two existing stations at Calcutta and Bombay, the preparation and final organisation of a third station—at Delhi—which was nearing completion, the recruitment of staff and the preparation of a development scheme. He, however, found himself the sole officer at Headquarters with an office consisting of eight clerks only. The new station at Delhi came into operation early in 1936. In the middle of the year the post of Deputy Controller of Broadcasting was created and later, that of a Chief Engineer. During the same year some staff was sanctioned for research which remained attached to Headquarters till 1937 when the Research Department was constituted into a separate office. The clerical staff was increased to 20 in 1936-37, to 35 in 1937-38 and to 49 in 1938-39. In 1938-39 the post of an Administrative Officer was added, bringing the total number of Headquarters officers to 4. The posts of a Director of Programme Planning, Director of Publicity and Assistant Chief Engineer were also sanctioned but it was not found possible to fill them during this year.

356. The Installation Department was created in January 1937 with a staff consisting of one Installation Engineer, 2 Deputy Installation Engineers, 3 Assistant Engineers, 3 Technical Assistants and 6 Clerks. A post of Divisional Accountant was sanctioned during 1937-38. Since then there has been no change in the staff strength.

357. In April 1937, a separate Research Department was created and the Research Engineer whose post was gazetted at the same time was shifted from Headquarters and placed in charge. His staff consisted of 1 Assistant Engineer, 1 Technical Assistant and 3 Clerks. An additional clerk was sanctioned in 1938-39 and 3 Technical Assistants were added on the installation of the Receiving Centre at Delhi in August 1937.

358. The Indian Listener, which had hitherto formed part of the Bombay station, was made an independent charge from April 1937, with the Editor as head of office and a staff consisting of 1 Sub-Editor and 4 clerks transferred from the Bombay station. "Awaz" was similarly shifted from the Delhi station in 1938-39 and placed under the Editor of the "Indian Listener" with one sub-Editor and 4 clerks. Later in the year, two additional clerks for the office of the "Indian Listener" and one transliterator for "Awaz" were also sanctioned

359. Another subordinate office, that of the News Editor was added in September 1937. The staff consisted of 1 News Editor, 1 Sub-Editor (sanctioned later during the year), 3 clerks and 5 translators (of whom only two were recruited during 1937-38). In 1938-39 an Assistant News Editor was added and the three remaining posts of translators were also filled

360. In the meantime the number of stations rose from 2 in 1934-35 to 7 in 1938-39. In terms of transmitters, whose number has a direct bearing on the strength of the engineering staff required, the increase was from 2 in 1934-35 to 12 in 1938-39. The first receiving centre was erected in 1937-38 and two more were added in the following year.

361. The head of a radio station is the Station Director. The staff under him may be divided into 3 categories : (*i*) Programme staff, consisting of a team of Programme Assistants and Announcers headed by the Director of Programmes, (*ii*) Engineering Staff, consisting of Assistant

Engineers. Technical Assistants and mechanics working under the Station Engineer and (*iii*) Clerical Staff.

362. When the present Controller of Broadcasting took over charge of the Department in 1935, the programme staff at Calcutta including Announcers consisted of four officers and at Bombay of three. The staff for the new Delhi Station was raised at the instance of the Controller to one Director of Programmes and 4 Programme Assistants almost as soon as the station came into operation and to one Director of Programmes and 6 Programme Assistants in 1936-37. The scale of pay sanctioned for Programme Assistants was Rs. 60. The Controller found this scale far too low, and therefore in the case of the Delhi Station created under his own powers, four new posts on Rs 100. The Government of India later accepted the figure of Rs. 100—10—200, but this also was found to be too low to attract or retain people of the requisite calibre, and the scale was raised to 150—10—250. This owing to financial difficulties could not, however, be done without reducing the number of Programme Assistants again to 4—which was adopted at Calcutta and Bombay also and which remains the normal staff strength for all stations. An additional Programme Assistant and Announcer for each additional transmitter are sanctioned for stations having more than one transmitter, in order to cope with the increase of work due to alternative programmes. The number of Programme Assistants originally sanctioned for 5 K.W. mediumwave stations at Lahore and Lucknow was 3, but this was also subsequently raised to 4.

363. Two posts of Assistant Station Director were sanctioned in 1935-36 for Delhi and Bombay and one for Calcutta in 1937-38 as in view of the heavy administrative responsibilities involved, it was felt necessary to afford some relief to the Station Directors at these stations.

364. The increase in programme staff could not, however, keep pace with the increase in work. It is not often realized that the organization of broadcast programmes demands constant attention to endless details and quite frequently a half hour item involves a volume of work which is spread over days and sometimes weeks of thought and labour. Programmes are to be sent to press a month in advance, complete in every detail relating to timings, wavelengths, relays, music, songs, talks, plays, speakers and artists. This is obviously not possible unless the programmes are planned very much more ahead, the talks are arranged according to a well thought out organic scheme, the topics chosen have a conscious purpose behind them, the speakers selected are of the requisite standard and qualifications, the various types of music are adequately balanced, suitable artists for the various categories have been chosen in due proportion, the plays have been earmarked, secured and edited and the casts have been selected. A large number of people have to be booked and difficult negotiations involving delays and disappointments have to be conducted, sometimes by personal interviews, very often by correspondence. Fees have to be settled, times have to be agreed upon, items have to be arranged by mutual consent. And after the authors, speakers, artists, compositions and scripts have been definitely booked, there are manuscripts —of talks, plays, dialogues, feature programmes—to be read, perhaps altered and rewritten and the necessity and import of the alterations discussed with the authors ; and singers, accompanists, orchestras, talkers, plays, outside broadcasts and feature programmes have to be rehearsed,

sometimes twice, sometimes twenty times before they are fit to go before the microphone. All this is of course in addition to the daily conduct and transmission of programmes which extend from 5 to 10 hours a day during which, part of the programme staff must be on duty to see that the programme strictly follows the schedule and, when emergencies arise, to take intelligent and prompt decisions. Side by side with these activities the search for new ideas, new talent and new opportunities must continue, for broadcasting goes on from day to day without pause or rest and the demands made on the originality and the ingenuity of programme builders are inexhaustible.

365. The bulk of the responsibility for initiating programme composition falls on the Programme Assistants, but the Director of Programmes is responsible for their collection and balance and for the final organization of programme material, and supervises the conduct of rehearsals, transmissions and studios.

366. The Engineering staff is on duty at the transmitter as well as in the control room at the studios and since the two are generally at considerable distance from each other, separate teams at each point are necessary. In addition to the conduct of daily transmissions, the engineering staff is in charge of the technical equipment of the studios and on duty at rehearsals, outside broadcasts and recordings. The strength of the technical staff has also been increased during recent years and it is now possible at least at the major stations to ensure that no member of the engineering staff should be on duty for more than seven hours a day and six days of the week. Extra staff is provided for additional transmitters and receiving centres

367 The Station Director deals with all administrative and financial matters, duties and hours of staff, the supervision of accounts, contracts with artists, speakers and authors, purchases, supervises all the issues and receipts and is finally responsible for public relations and for the direction and supervision of all programmes both in their preliminary arrangements and in their actual execution. The Assistant Station Director acts as his deputy and understudy. Quarterly conferences of Station Directors under the presidentship of the Controller are held at various stations in turn, to co-ordinate programmes for the coming quarters and to discuss various matters of policy of mutual interest or of importance to the whole service. Seven such conferences have been held since January 1937.

368. By arrangement with the B B.C. the Government of India sanctioned the administrative training of 2 people at a time from the programme side at the B.B.C. for a period of 3 months. The following members of the programme staff of All India Radio have been trained since the inception of the course up to the 31st March 1939 :

		Course.
1. Mr. Victor Paranjoti	..	January—April 1937
2 Mr A. K. Sen ..	..	January—April 1937.
3. Mr. Z. A. Bokhari	..	April—June 1937.
4 Mr P. V. Acharya	..	April—June 1937.
5. Mr. B. K Nundee ..	..	January—March 1938.
6. Mr. A. A. Advani ..	..	October 1938—January 1939.
7. Mr. Rashid Ahmed	..	October 1938—January 1939.
8. Mr. N. A. S. Lakshmanan	..	January—April 1939.

369. A statement showing the increase in the number of subordinate offices, in the number of staff (both officers and clerks) and in the expenditure on staff, side by side with the increase in the number of stations, transmitters, receiving centres and radio journals is given below :

Details of subordinate officers and staff employed.

Year.	No. of Stations	No of Transmitters.	No. of Receiving Centres	No. of Radio Journals.	No of Subordinate Offices.			Staff Strength.								Salaries of Staff.
					Stations.	Others.	Total.	Head-quarters.		Stations.		Other Subordinate Offices.		Total		
								Officers	Clerks	Officers	Clerks.	Officers.	Clerks.	Officers	Clerks.	
1930-31 ..	2	2	..	2	2	.	2	Part of the Posts and Telegraph Department		25	9	..		..	.	83,513
1931-32 ..	2	2	..	2	2	..	2			25	9	..	..	..	..	76,343
1932-33 ..	2	2	..	2	2	..	2			25	9	..	..	..	..	[illegible]6,615
1933-34 ..	2	2	..	2	2		2			25	9	.	.	.	..	75,994
1934-35 ..	2	2	..	2	2	.	2	1	8	29	12	..	.	30	20	87,289
1935-36 ..	3	3	..	3	3	..	3	2*	8	64	19	..	.	66	27	1,19,841
1936-37 ..	3	3	..	3	3	1	4	6†	22‡	64	27	9	6	79	55	1,56,594
1937-38 ..	5	7	1	3	5	4	9	3	35	88	35	23	17	114	87	2,33,287
1938-39	7	12	3	5	7	4	11	4	49	122	46	28	24	154	119	3,51,113

* One Editor, "Indian Listener," transferred to Bombay.

† Including three members of the Research Staff which was transferred to the Research Department in the following year.

‡ Includes two clerks who were transferred to the Research Department.

NOTE.—This statement excludes Trichinopoly which did not come into operation till 1939-40. Some staff was, however, appointed for this station in 1938-39.

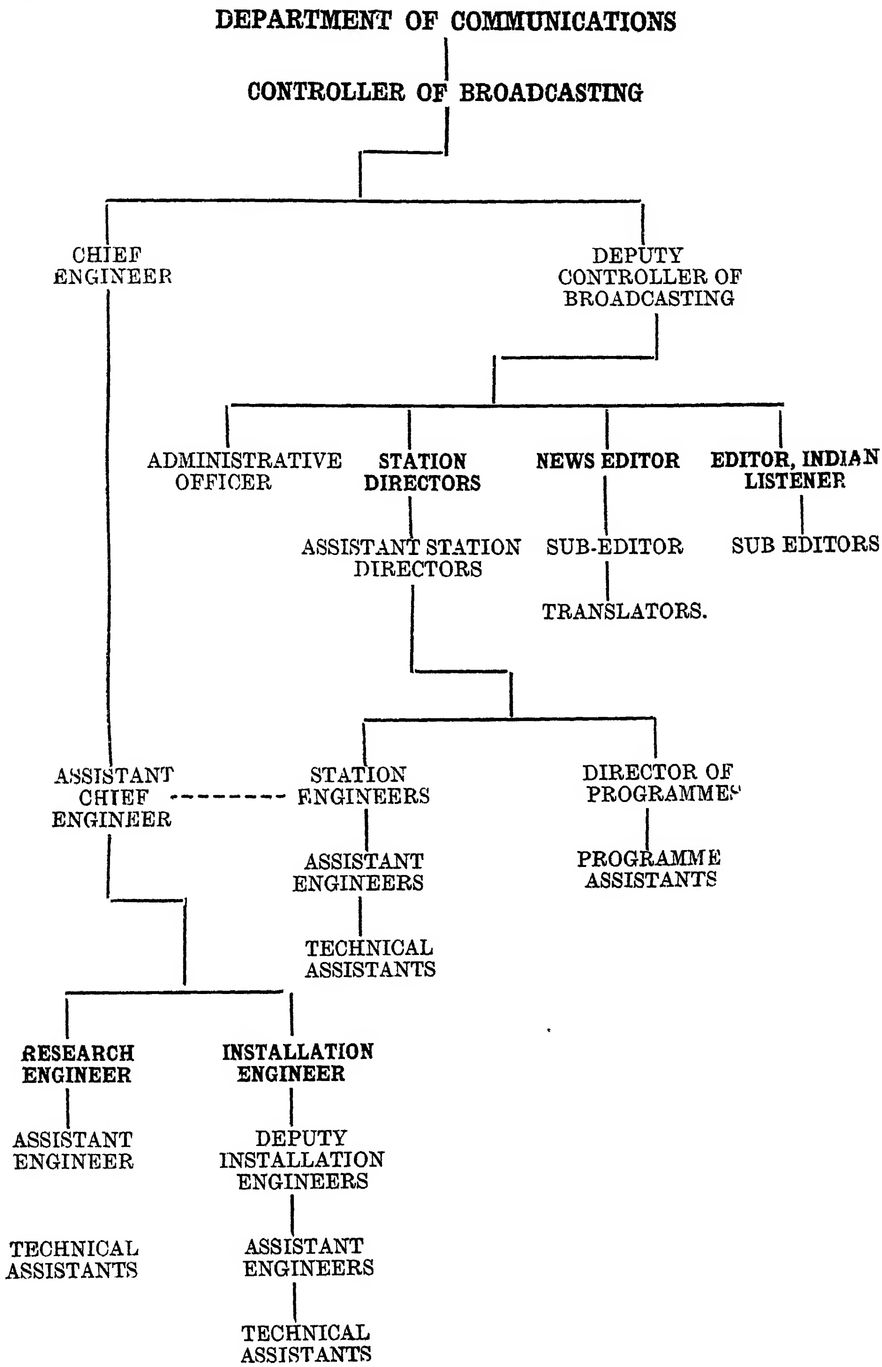
370. Three statements giving the following information are also appended :

Appendix VII.—Designation of Officers and staff and scales of pay.

Appendix VIII.—A distribution list of the sanctioned staff at the Stations and other subordinate offices as on the 31st March 1939, and

Appendix IX.—Communal composition of the staff in employment as on the 31st March 1939.

371. A chart showing the inter-relation of the various officers in AIR is given below :—



372. Recruitment to the ministerial staff of the headquarters office is made through the Home Department of the Government of India who appoint candidates who pass the competitive tests conducted by the Federal Public Service Commission. Recruitment to the posts of Station Director, Station Engineer, Assistant Station Director, Director of Programmes, Assistant Engineer, etc., is made through the Federal Public Service Commission and to the posts of Programme Assistants and Technical Assistants through Selection Boards appointed by the Government of India for the purpose, and consisting of official and non-official members.

373. A talk on "Broadcasting as a Career" was broadcast by the Controller in 1938, from which it may be permitted to quote here at some length, as it contains some observations on the qualities required for a broadcasting staff which are germane to this chapter, and on which this account of the organization and staff of All India Radio might be fittingly closed.

374. "To enumerate qualifications," said the Controller, "is a dangerous thing which may rebound like a boomerang on my own head, and, in any case, I doubt whether it is possible to apply qualifications rigidly to such things as broadcasting. Nevertheless, it is desirable to give some indication of the qualities which are required, if only to avoid the expense and trouble of useless journeys for many would-be applicants.

"As far as the technical side is concerned it is fairly easy to assess them, and I am going to deal with this very briefly because it is a much straighter issue than the programme side. And, by the way, these two sides are completely different: most candidates who come to see me don't appear to realise that. I have hardly ever known a technical man who was good at programmes or a good programme man who was mechanically minded. You don't expect an editor to be in charge of a printing press, or a compositor to edit the paper. You don't expect the captain of a ship to be an engineer or a ship's engineer to understand navigation. But for some queer reason—perhaps because broadcasting is young—the two sides of broadcasting are often jumbled up.

"The technical man in broadcasting is required to have, first of all a sound training in engineering and secondly an experience of the particular and complex apparatus used in radio equipment. Here in India we want men with degrees in electrical engineering, and, if possible, with some post-graduate experience in wireless communication. And that does not mean text-book knowledge: broadcasting needs *practical* men and no text-book can supply the practical training which is required. Our demand must of course conform to the supply, but so far we have fortunately been able to secure sufficient men with the necessary qualifications, and we must, of course, give the first chance to those who already possess those qualifications. We have not started a training school on the technical side because we do not as yet need one, and so long as men with the necessary experience are available, we shall avoid training schools and probationers. I make a special point of this because many candidates with no qualifications are anxious to be taken for training, free of cost, or even to pay for training, and it is obvious, I hope, from what I have said, that so long as a sufficient number of trained men is available, we cannot do this.

" One last word about the technical side : it is useless for candidates to ask us to recommend schools or firms or courses of training : we cannot make invidious distinctions between one college and another, or one firm and another, and any such advice would involve us in a kind of guarantee, which it is impossible to give, that training would result in employment. At present there are only three grades in the technical service of All India Radio—the Technical Assistants, of whom there are about six at each transmitter, the Assistant Engineers, of whom there are two at each transmitter, and the Engineer in charge : but later, as the service develops, higher engineering posts are likely to become available in the research, installation and central engineering branches. So much for the technical side.

" Now for the most difficult part of this talk—the programme staff. Difficult, because we are no longer dealing with paper qualifications but with abstract values which are, and must be, to some extent, a matter of taste and opinion, and therefore controversial. It is fairly easy to say that an engineer is efficient or inefficient, knowledgeable or ignorant ; but who is to be the final judge of a producer whose programmes will be bones of contention among listeners ? I don't think I can remember, in my eight years at the B. B. C., a single programme which did not receive both praise and blame from listeners, or a single item on whose merits even the staff of the B. B. C. were fully agreed. In India programme-making has the additional complication of communal jealousy, *and*, in spite of questionnaires which here in Delhi, as in other parts of the world, show conclusively that each listener wants precisely what his neighbour dislikes, I don't think that a broadcasting service can ever hope to please *all* the listeners *all* the time. This leads to another conclusion which is that, agreement amongst listeners being impossible, broadcasting is compelled to frame its own policy, and its own policy, I think, should be to raise the level of public taste without losing the listeners' interest and attention. This is an important point and I am going to repeat it—to raise the level of public taste without losing the listeners' interest. If broadcasting caters for the lowest common factor of public taste, it becomes, in the end, nothing but a boring background noise, a sort of sentimental accompaniment to everyday life, and throws away all its opportunities : if, on the other hand, it can keep just a little ahead of its listeners, while catching their interest, it cannot only expend its own horizons, but provide continually fresh sources of interest to its listeners.

" How does this apply, you ask, to a programme staff ? In the first place, a programme staff, whatever advisory councils or committees you may have, is ultimately responsible for guiding the policy of broadcasting. It is they who must in the first place suggest the subjects, speakers, and artists to be included in broadcast programmes, and their tastes and outlook must, to some extent, colour the programmes given : it is chiefly through their ingenuity and trouble that the human material of programmes can be *produced* in such a way as to hold the listeners' attention. If the listener is bored, broadcasting fails, and after ten years' experience I can assure you that there isn't really in *any* country enough ready-made talent to fill new broadcast programmes every day. If you are going to do this successfully you have got to have ability to *present* your speakers, your singers, your dramas, your news, in such a way that

they will tickle the listener's ear agreeably. The programme staff of a broadcasting station is in the same position as the editor of a newspaper who can make an exciting column out of a dull item of news, or a film producer who can twist a boring story into a first-rate picture

" All this talk leads me to this point—that the first necessity of those who wish to join the programme staff of broadcasting is precisely this indefinable quality of being able to make bricks without straw—or if you like to put it another way, a special type of creative imagination Broadcasting divides itself in this country into five main activities—music, drama, news, talks and education, and rural uplift—horrible word, but I can't find another. In dealing with each of them this quality is essential. Now this type of *constructive* ability is rare in any country, but it is, I think,—and I have seen over 2,000 candidates—especially rare in India Don't let us argue about causes, but let us agree that independent thought is at a low ebb. A distinguished educationist said to me the other day : ' Young India today has no *intellectual curiosity* '—and that is what I find among so many of the candidates who come to see me. Broadcasting deals with every subject under the sun, and the man who makes a success of it must be, in the best sense of the word, a dilettante—he must take an interest in, and know something about, everything. If he is to attain promotion he must know enough of music, drama, literature, rural conditions, and international affairs to be able to exercise some control in each sphere : he must be bold and able enough to alter the manuscript of the most distinguished speaker—for even distinguished speakers are often dull and prosy—and to insist on the discipline and obedience of the most distinguished artist.

" I have mentioned two qualities—constructive imaginative ability and intellectual curiosity. A third is *alertness*—a quality which is also rare in India. A broadcasting station, though you may not think it, has a continual series of crises—the speaker fails to arrive, the lights go out, the lines break down, the singer faints, the manuscript is lost, the string of an instrument breaks, and so on. Apart from these there are the more subtle problems—the singer who goes out of tune, the orchestra which is out of balance, the gramophone pick-up which gives a bad transmission, the speaker who talks too fast. All these things need a constant alertness, and if that alertness is not present in a programme staff, the programmes will decline and fall into a dull routine.

" Now I hope I have made it clear how difficult it is to label the qualifications of a programme staff. You will notice that I have not mentioned administrative ability, experience, or education. These things have their importance, and good administration is of course one of the essentials of a well-run broadcasting station. But they are as nothing compared to the other qualities What matters in broadcasting is not whether a station is tidy or whether rules and regulations are observed, but the *quality* of the material which goes into the microphone. What we need are people with ideas of their own, the capacity of independent and original thinking, a keen intellectual curiosity and an unflagging zeal."

CHAPTER VII.

LICENSING REGULATIONS.

CHAPTER VII.

LICENSING REGULATIONS.

SECTION 1.

General.

375. " Most national laws relating to the establishment of wireless receiving stations by private persons require that such persons shall procure an official licence, the possession of which is subject to a fixed periodical fee. Owners of clandestine receiving apparatus are liable to sanctions, generally of a sufficient serious nature."

376. This is the bald and melancholy statement which forms the opening paragraph of a Union Internationale de Radiodiffusion publication giving a general survey of national laws regulating the possession of wireless receiving apparatus in most of the broadcasting countries of the world. With a few exceptions, notable among them being the United States of America, State control of receiving apparatus is a recognised feature of broadcasting in the greater part of the world. Licensing laws follow certain well recognised principles, although there are minor variations within this general framework. For example certain countries (including Belgium, Germany, Switzerland and Yugoslavia) in which broadcasting is nationalised or semi-nationalised expressly exclude State responsibility for imperfect reception. Practically all countries (in accordance with the duty imposed on them by the Washington Convention Article 5) prohibit listeners from divulging to any third party (except in the case of an authorised official or the legally competent tribunal) any message which they may receive by wireless other than communications intended for public use. In the majority of countries representatives of the Ministry of Posts, Telegraphs and Telephones have the right to inspect receiving apparatus. Government everywhere reserve the right to prohibit the use of receiving apparatus in the interests of public safety and the power to revoke the authoritisation of licences not conforming with the requirements Some countries have made special provisions relating to minors whereby authorisation or licence is granted on the responsibility of the parents or guardians or legal representatives. Foreigners generally enjoy the rights of reciprocity, but in many cases licences are issued by the Central authority instead of from a local office. In some countries, such as Great Britain and Germany, the same licence covers every kind of fixed receiving station, whatever the number of valves or the object, although in Germany a graded entertainment tax is imposed on performances by broadcasting in hotels and taverns. In others a distinction is made between private subscribers, dealers (and makers) of wireless apparatus and public establishments or between crystal sets and valve sets, and again in some countries the fee charged varies with the number of valves.

377. The annual fees charged for fixed stations for private use in the principal broadcasting countries of the world are given below :—

Country.	Annual Licence Fee.	Annual Licence Fee in Indian Currency. Rs. As.
1. Belgium ..	.. 60 Frs. (20 Frs. for crystal sets) ..	5 15 (Rs. 2 for crystal sets).
2. Denmark	.. 10 Kr.	5 15
3. France ..	.. 50 Frs. (15 Frs. for crystal sets) ..	3 12 (1/2 for crystal sets).
4. Germany	.. 24 RM.	27 6
5. Great Britain	.. 10 Sh.	6 11
6. Hungary ..	.. 28·80 P.	16 5
7. Ireland ..	.. 10 Sh.	6 11
8. Italy ..	.. 81 Lire	12 2
9. Norway ..	.. 20 Kr.	13 6
10. Spain ..	.. 12 Pes. (2·50 Pes for crystal sets)	6 6 (1/5 for crystal sets).
11. Sweden ..	.. 10 Kr.	6 14
12. Switzerland	.. 15 Frs. (*plus* a single registration fee).	9 10
13. Turkey ..	.. 5 Lto. 10 L	60/10 to 121/3
14. U. S. S. R.	.. 24 Roubles (3 roubles for crystal sets).	33/13 (Rs. 4/4 for crystal sets).
15. Egypt ..	.. 80 Piastres (+5 P. per valve) ..	11/1 (+0-11-0 per valve).
16. Japan ..	.. 6 Yen	7 10

In some countries, blind persons and certain charitable and educational institutions are exempted.

378. In India, licensing regulations follow the same principles as are observed in most countries, although the details naturally vary according to local conditions and exigencies. The following sections contain an account of these regulations and of the measures adopted to check evasion.

SECTION 2.

Licences.

379. All licences permitting the establishment, maintenance or working of wireless apparatus in British India are issued under the Indian Telegraph Act ; the Act has been applied to administered areas and Railway lands, but not to the tribal areas of the N. W. F. P.

(I) *Different kinds of Licences.*

380. (i) **Broadcast Receiver Licences** cover broadcast reception, experiment and instruction with wireless receiving apparatus for private and domestic purposes at a specified address. These are issued at autho-

rised Post Offices and may be obtained by persons of any age of either sex and of any nationality, but except in the cases of administered areas and railway lands are not available for the use of wireless apparatus in Indian States or Foreign territory. The licences are not transferable from one person to another. In the event of the decease of a licensee, the licence is regarded during the unexpired portion of its currency as covering the use of wireless receiving apparatus at the address of the licensed station, only by any member of the family of the deceased. The duration of a licence is 12 months from the 1st day of the month of issue, except when a licence is renewed prior to the date of its expiry, when its date of expiry will be the anniversary of the licence to which it is a renewal. The fee is Rs. 10 and if the licence is renewed before expiry, the charge for renewal is Rs. 9 only.*

(*a*) A single B/R licence covers the use at the address specified in the licence only, of any number of wireless receiving sets by the licensee or his family.

(*b*) A B/R licence may also be issued to clubs, messes and similar institutions where the members constitute a corporate body for the reproduction of programmes in the public rooms of the same premises for the benefit of members only. Such a licence would not cover the use of the apparatus on occasions when the general public are admitted, such as public subscription dances, bazaars, concerts, etc. As a special concession to institutions such as hospitals, sanatoria, etc., and educational establishments, a B/R licence may be issued where the receiver and loudspeaker are installed by some responsible official in the common rooms, for the free use of the patients, students and staff. For this purpose a single licence will cover the whole of a single set of self-contained premises even if there are several buildings, provided they are within the same compound, but private residential quarters even in the same building require separate licences for each.

(*c*) A licence issued to cover the use of a portable receiver covers the use of that receiver only.

(*d*) B/R licences may be issued for the use of receiving apparatus in motor cars. In such cases the application form must have the words ' for use in motor car '.

(*e*) For ships equipped with commercial wireless installations, B/R licences are issued to the ship-owners (and not to passengers, or members of the crew individually). B/R licences are also issued for ships *not* equipped with wireless installations. In this case licence is issued to individual officers or members of the crew.

(*f*) For the benefit of persons who are required to tour extensively, a licence may be issued available throughout British India. In such a case the licence only covers the use of one wireless receiving set.

381. In no circumstances, however, does a B/R licence cover the reproduction of broadcast programmes either for gain, or in the rooms of hotels, restaurants or any business premises to which the public have access.

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*This concession has since been withdrawn from the 1st January 1940.

382. A "substitute" licence is issued in replacement of a lost licence on payment of a fee of Rs. 2. A "substitute" licence remains valid during the unexpired period of the original licence.

383. Where a special printed sanction has been obtained from the Director-General, Posts and Telegraphs, a broadcast receiver licence may be issued to a municipal, local or similar body to enable them to reproduce to the general public free of charge, broadcast programmes. Such a licence permits the use of one set and loudspeakers at one place at a time. The policy of All India Radio has been to discourage community listening as far as possible (except in villages or in areas where no independent sales could be expected) for the following reasons :—

(1) They limit the sale of independent receivers and thus have an adverse effect on the revenues of A. I. R.,

(2) They may be used to transmit undesirable material in times of crisis, and

(3) They are in most cases technically unsatisfactory and the distorted reproduction injures the reputation of A I. R. and further discourages the sale of independent receivers.

384. The use of community receivers in *villages* is, however, encouraged, as the benefit in this case goes entirely to those who cannot afford to buy radio sets of their own.

385. (ii) **Commercial B/R Licences.**—In the case of the reproduction of broadcast programmes in the rooms of business premises to which the public have access, a special form of licence is in use. This type of licence is valid for 12 months from the first of the month in which it is issued and the annual fee is Rs. 25 for one receiver and one loudspeaker or similar appliance directly connected thereto, and an additional Rs. 10 for each additional receiver or loudspeaker or similar appliance. If the licence is renewed for subsequent years a reduction of Rs. 5 from the original fee is made for the same number of sets or loudspeakers, provided the licence is renewed on or before the date of expiry, *i.e.*, the annual renewal fee will be Rs. 20 for one receiver and one loudspeaker, and additional Rs. 10 for each additional receiver or loudspeaker. The term "one receiver" will ordinarily be held to cover apparatus capable of receiving and reproducing a single broadcast programme at a time. In the case of business premises one licence will cover the reproduction, only at the premises specified in the licence. The licence conveys no permission in respect of infringement of copyright in the matter broadcast and the licensee has to make his own arrangements with the copyright holders in so far as such claims have not already been met by the broadcasting authority. Such licences are also issued to the proprietor or manager of a touring organisation such as a Circus, Concert or Theatre party, etc., and are available for use throughout British India, but only for use of wireless apparatus at one place at a time. Licences are also issued for sets installed in public vehicles and railway trains.

386. (iii) **Demonstration Licences** are issued for the benefit of dealers in wireless apparatus who wish to demonstrate wireless receiving apparatus on their premises or at the residence of a prospective customer. Such licence covers the demonstration of any number of wireless receiving sets

provided that only one set is demonstrated at a time Under this licence a set may be demonstrated at a customer's residence for a period not exceeding 15 days. A dealer may obtain as many licences as he desires to enable him to demonstrate at more than one place at the same time. A demonstration licence must accompany and remain with the apparatus being demonstrated. The fee which was originally Rs. 10 for each licence issued was reduced to Rs. 5 on the 15th January 1938.

387. (iv) **Possession Licences.**—Under the Indian Wireless Telegraphy Act, 1933, all persons residing in British India, who are dealers in Wireless Telegraphy apparatus must be licensed to possess that apparatus. These licences are issued to cover the apparatus kept at one address only. The term " dealer " covers any person who deals in or manufactures for gain wireless telegraphy apparatus. The term Wireless Telegraphy includes wireless telephony also. The fee is Rs 10 per annum Under the Indian Wireless Telegraphy Act, 1933, all persons in British India who are *not* dealers in Wireless Telegraphy Apparatus but *possess* a complete wireless set must be licensed either under the Indian Telegraph Act, 1885, to establish, maintain and work wireless telegraphy apparatus or under the Indian Wireless Telegraphy Act, 1933. to possess wireless telegraphy apparatus. It will be observed, therefore, that any non-dealer in British India who possesses a complete wireless set must be licensed, and. as a B/R licence enables a person not only to possess wireless telegraphy apparatus but also to establish, maintain and work it, a B/R licence is most suitable for non-dealers Possession licences are not exchangeable or transferable and do not authorise the licensee to establish, maintain or work wireless telegraphy apparatus.

388. (v) **Import (Wireless Telegraph) Licences** are issued under the Sea Customs Act, 1878. and cover the importation into British India of wireless transmitting apparatus or receiving apparatus incorporated in one unit with transmitting apparatus The fee is Rs. 10 per annum This licence only permits the importation of wireless apparatus into British India and does not license the possession or the establishment, maintenance or working.

(II) *Legislative Enactments.*

389. All Telegraphs (including Wireless) are governed by the Indian Telegraph Act, 1885. This Act vests in the Governor-General-in-Council the exclusive right to establish, maintain and work wireless apparatus. The Act only restricts " establishment, maintenance and working ". It does not apply to possession, and in practice to establish an offence under this Act it is necessary to prove that a wireless set has been worked, *i.e.*, used for the reception or transmission of signals without a licence. As a result of this limitation difficulty has been experienced in preventing evasion.

390. The Indian Wireless Telegraphy Act, 1933, was passed with the express intention of assisting in the prevention of evasion of payment of licence fees It provides that no person shall possess wireless apparatus without a licence under the Act unless exempted. The Indian Wireless Telegraphy (Possession) Rules, 1933, which were promulgated under this

Act exempt from the necessity of holding a licence to possess all persons other than dealers who hold a licence under the Telegraph Act, or who are in possession of wireless apparatus other than a complete wireless set. All dealers in wireless require a licence to possess, whether they have a licence under the Telegraph Act or not. Dealers are also bound to keep a register of wireless apparatus in their possession and record the name and address of every person to whom they sell a complete wireless set, and in the case of a complete wireless set to demand production of a licence and to record the particulars of the licence. They are, however, permitted to sell a complete wireless set to a person not possessing a wireless licence provided they forward to the proper issuing authority within 48 hours of the sale, exclusive of holidays and Sundays, on behalf of the purchaser and application for a licence, together with the necessary fee The production of a licence is not required in the case of apparatus sold to persons domiciled in Indian States for use *outside* British India. It is pointed out that if requested, persons possessing wireless apparatus although not required to maintain a register, are bound to give information regarding the disposal of wireless apparatus.

391. Under the Indian Wireless Telegraphy (Possession) Rules information required may be obtained from owners of wireless sets whether such owners are licensed or not, so that cases of the working or possession of wireless sets without licence under both the Telegraph Act and Wireless Telegraphy Act can be detected.

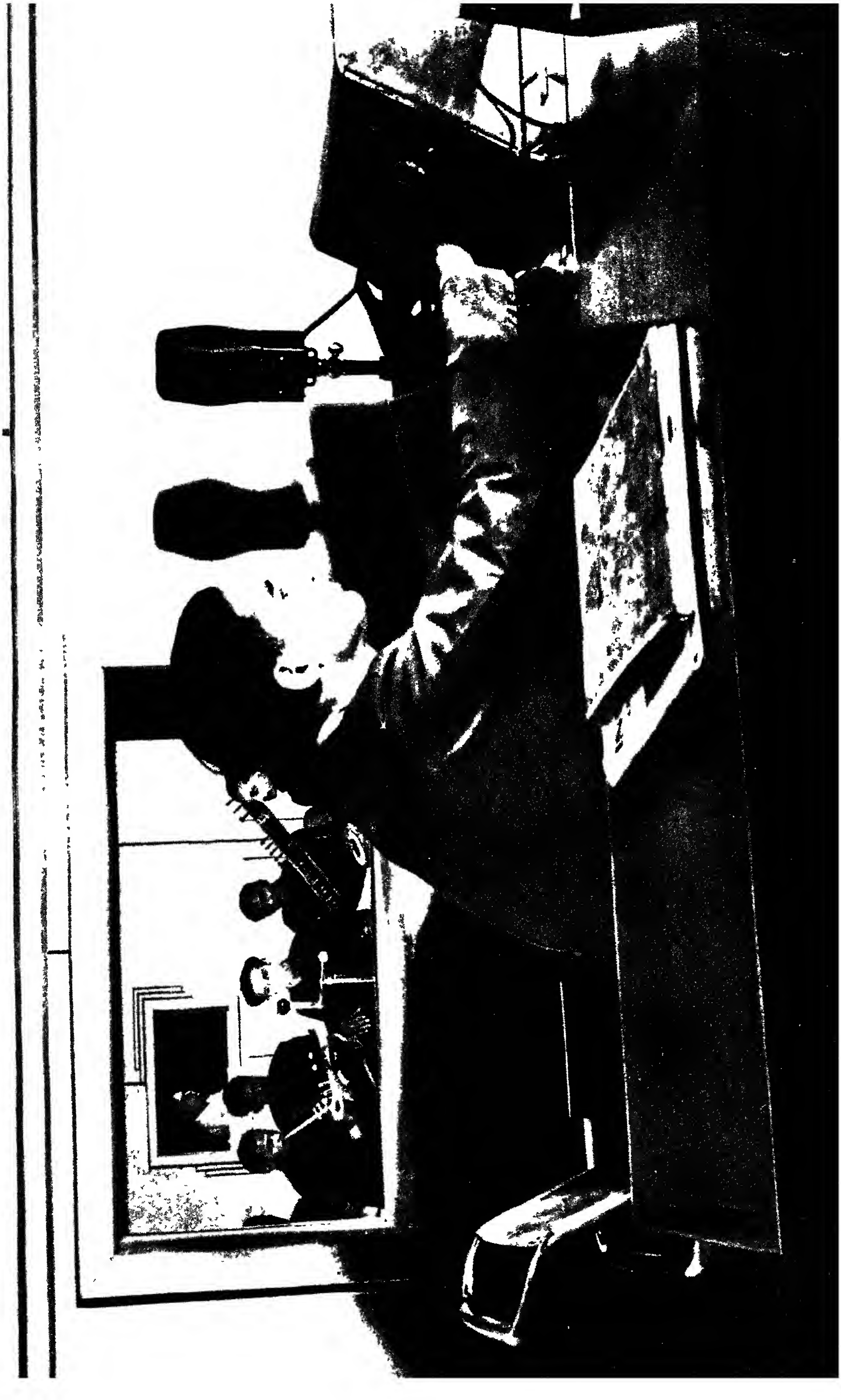
SECTION 3.

Anti-piracy Measures.

392. The detection of cases of evasion of licensing rules is a difficult and baffling task. Till May 1932 anti-piracy work was carried on by the Posts and Telegraphs Department. On and from the 1st June 1932 it was transferred to the Indian State Broadcasting Service, and the two temporary posts of Wireless Investigating Inspectors on a pay of Rs. 160—10—250 per mensem were continued. One of these Inspectors was posted at the Calcutta Station and the other at Bombay. This arrangement continued till the 1st March 1936, when anti-piracy work was re-transferred to the control of the Posts and Telegraphs Department. These arrangements have now been extended up to the 28th February 1940.

393. Up to June 1932 the Posts and Telegraphs Department retained 1/5th of the fees in respect of B/R and Fixed Station licences in order to meet the cost of issue of licences and anti-piracy When anti-piracy was transferred to the Indian State Broadcasting Service, the Posts and Telegraphs' share was reduced to 1/10th of the fees. On resumption of anti-piracy by the Posts and Telegraphs Department this was raised with effect from the 1st April 1936 to Rs. 2 per licence for all types of licences except possession licences, and for renewal as well as issue.

NOTE.—For table of the number of B|R licences issued, etc., in India see Appendix X.



394. The following statement will show the strength of staff employed on anti-piracy work :—

Staff sanctioned for Anti-piracy.

Year.	Wireless Investigating Inspectors.	Wireless Licence Inspectors.	Clerks	Remarks.
1928 ..	1 (Bombay) 1 (Calcutta).	..	.	
1929 (January)	The two posts above* were made permanent.	..	..	*In addition to this a few clerks and paid staff, who were termed "informers," were employed.
1936 (February)	..	3 (Calcutta)+1 Sub-Inspector.† 3 (Bombay). 1 (New Delhi). 2 (Madras) 1 (Rawalpindi).	1 (Calcutta) 1 (Bombay).	† Later reclassified as a clerk.
1936 (November)	..	1 (Calcutta) .. 1 (Nagpur). 2 (Lucknow). 1 (Patna). 1 (Karachi)	1 (Nagpur). 1 (Lucknow). 1 (Patna). 1 (Karachi). 1 (Lahore). 1 (Madras).	
1937 (March)	..	..	2 (Calcutta).	
1938 ..	5	19	6	
Total staff now employed.	7	35	17	

It will be seen that the *total* staff now employed on anti-piracy work is—

7 Wireless Investigating Inspectors,
35 Wireless Licence Inspectors,
and 17 Clerks.

395 The statement given below shows the number of cases of evasion detected, the number of prosecutions, the number of convictions and the fines realised from 1934-35 to 1938-39 :

Station.	Number of cases detected.	Number of prosecu-tions.	Number of cases convicted.	Fines realised.
1934-35.				Rs.
Bombay ..	247	9	9	345
Calcutta . ..	408	14	13	375
Total ..	655	23	22	720
1935-36.				
Bombay . .	188	7	7	280
Calcutta . .	489	32	31	1,100
Other places ..	39	..	.	.
Total ..	716	39	38	1 380
1936-37.				
Bombay .. .	245	2	2	90
Bengal	193	34	33	800
Other places in British India.	791	3	3	30
Total ..	1,229	39	38	920
1937-38.				
Bombay	209	3	3	450
Calcutta	326	43	41	1,542
Other places ..	1,390	26	17	560
Total ..	1,925	72	61	2,552
1938-39.				
Bengal and Assam .	206	68	55	1,017
Punjab & N. W. F. P.	793	10	8	200
Madras	513	34	16	234
U. P.	409	56	42	303
Bombay	239	57	33	1,075
Sind and Baluchistan	221	54	28	355
Central Provinces ..	91	11	4	290
Bihar and Orissa ..	42	9	1	60
Total ..	2,514	299	187	3.534

396. Some indication of the extent to which radio piracy exists may be gathered from the results of an anti-piracy campaign that was carried out early in January 1939. In November 1938, the Controller of Broadcasting proposed a concerted drive against radio piracy to take place from all stations. Station Directors were asked to give full particulars and suggestions regarding the proposed drive, and the Director-General, Posts and Telegraphs was requested to issue suitable instructions to the Postmasters-General. Instructions were accordingly issued for the whole of the wireless investigating staff to be available for the drive and the Assistant Postmasters-General responsible for evasion were specially charged with this work.

397. Press communiqués were issued by all Station Directors and by Headquarters well in advance of the drive. These explained where and how broadcast receiver licences could be obtained and mentioned that prosecutions would be launched against defaulters found as a result of the drive to be launched on January 16, 1939. It was stressed that A. I. R. did not want to harry its subscribers provided they paid their licence fees in advance. The "Indian Listener" in the issue of the 7th January 1939 appealed for the co-operation of the public, and throughout the issue were announcements similar to those in the general press

398. Lists of non-renewals and possible delinquents (both set owners and dealers) for periods varying from 3 to 6 months were drawn up and arrangements were made to requisition all available staff, both Posts and Telegraphs and A. I. R. The arrangements for distributing the work among the wireless inspectors and the other staff specially authorised to act as inspectors were also made. The Postmaster General, Nagpur, in whose jurisdiction there is no broadcasting station was requested to take similar steps and inform the Station Director, Bombay, of the results

399. A number of persuasive talks on the necessity of taking out licences, and the penalty for not doing so, were also broadcast by eminent persons both official and non-official.

400. The ground for the campaign having been thus prepared, the Anti-Piracy Squads at each station consisting of Wireless Inspectors and other officials of the Posts and Telegraphs Department and A. I. R began the hunt by train, car, tonga, bullock cart, cycles and on foot. Watch was kept on houses where radio sets were installed and a list of them was drawn up and checked with the list of licences in that area. Thus the list of suspected defaulters was drawn up without arousing suspicion. Lists of non-renewals obtained from the Posts and Telegraphs Department were also consulted. Dealers' shops and houses of set-owners were then visited and defaulters were generally given 48 hours grace to get a licence.

401. At Lucknow during the second fortnight of January 1939 there were 98 detections. Of these 14 licensees had lost their licences and since obtained substitutes. With a few exceptions all the 98 persons took out licences and the remainder were prosecuted according to the merits of each case. In Cawnpore alone 7 persons including a dealer were prosecuted successfully. In Rawalpindi 323 owners were checked and 110 were found without licences. In Delhi and New Delhi 162 licences were examined and 20 persons were found without licences. Similar steps were taken in Bombay as a result of which 30 prosecutions were undertaken in Bombay

City alone. There were 9 successful prosecutions in Karachi. In the N. W. F. P. out of the 750 set-owners checked there were 230 pirates, an average of over 30 per cent.

402. The campaign created a stir among listeners and there was a heavy rush for licences at all issuing Post Offices soon after the commencement of the campaign. As a result there was a phenomenal rise in the number of licences issued. 6,502 for November and 7,448 for December 1938 were both records and the figures for January 1939 rose to 9,570. The number of licences issued by the Calcutta G. P. O. and the sub-post offices during the first fortnight in February 1939 showed a 100 per cent. rise over the figures of issues for the same period in 1938. The Postmaster, General Post Office, Delhi, reported that the number of licences issued from 16th January to 21st January 1939 was 117 as against 21 issued during the same period last year.

403. Comparing the figures of previous years, it is not unreasonable to suppose that the drive was responsible for an increase of not less than 3,000 licences or an addition of Rs. 30,000 to the annual revenue.

SECTION 4.

A Note on the Elimination of Noise and Electrical Interference.

404. This seems an appropriate occasion for a brief mention of certain other conditions surrounding the possession of receiving apparatus which, though not falling within the category of Licensing regulations, should be of growing interest to the broadcasting authorities as well as the listening public. They have not yet formed the subject of legislation, but it may be taken for granted that as broadcasting progresses, they will attract the increasing attention of the law.

405. There is, for example, no doubt that efforts will sooner or later have to be made to protect the public against inconsiderate listeners using their loudspeakers in such a manner as to disturb their neighbours or the public passing in the streets Instances are not lacking in India in which local bye-laws have already been framed or invoked to mitigate noise or to restrict the operation of loudspeakers to hours during which they are least likely to cause inconvenience. Where the A. I. R. directorate has felt that such restrictions have been imposed without due regard to the rights and privileges of licence-holders or without giving them a reasonable chance to exercise voluntary control, A. I. R. has interceded on their behalf, and not always without success. But unfortunately it cannot be denied that a large number of listeners, specially owners of cafes and hotels, unnecessarily strain the lungs of their loudspeakers to the full. In doing so they invite unpopularity not only for themselves but also for broadcasting What is more, in trying to squeeze out of their set what they no doubt consider full value for their money, they are actually putting it to its worst use. In insisting on a really loud signal they become accustomed to a degree of distortion which should be extremely painful even to a moderately sensitive listener. Municipal and police authorities in most European countries take cognisance of inconsiderate use of loudspeakers and in some, this form of " disturbance of public tranquility " even attracts the Penal Code.

406. On the other hand increasing protection is also being given in most countries to listeners against avoidable interference with their enjoyment. No method exists of eliminating the various noises of natural electric origin, the only satisfactory improvements being obtained by an increase in the power of the transmitting station. But a diminution of man-made electrical interference is possible and a number of countries have been engaged for some time in systematic researches to this end.

407 These researches mainly aim at evolving a method of measurement capable of indicating with sufficient accuracy the amount of interference caused, so that it should be possible to set an objective limit and find a yard-stick which can be applied in practice to the diverse conditions which give rise to radio interference.

408 The most common sources of radio interference are however well known, and are comprised in the following groups :—

(1) Electric lifts.

(2) Trolley buses and trams.

(3) Household electrical appliances (fans, refrigerators, etc.).

(4) Electric motors used in commercial premises.

(5) " Neon " display signs.

(6) Certain rectifiers for power plant.

(7) Electro-medical apparatus.

409. On the question of compulsory powers *versus* voluntary action for the suppression of electric interference, the following extract from the Report of a Committee appointed by the Council of the Institution of Electrical Engineers (Great Britain) states the case very clearly :—

> " It became evident from the discussions of the Committee that the majority of members did not consider that effective interference suppression would result if the improvement of the position were to be left solely to voluntary effort. The manufacturers of appliances and plant which are liable to cause interference definitely support this view and they consider that there should be some recognised Mark which could be affixed to all portable appliances as a guarantee that such appliances comply with the requirements and that the sale of appliances which do not meet with the requirements should be prohibited Further, it is essential that imported articles should be subject to the same regulations, as home produced articles, and should bear the Mark, and it is only through legislation that this question can be dealt with successfully. *Frequently it is not the man who buys and uses the apparatus, but his neighbour who suffers from the resulting interference.*".

410 On the cost of suppression of interference in *existing* apparatus the Committee said : " Although the cost of correcting existing apparatus is undoubtedly higher than the cost involved if the apparatus is designed initially to be ' interference-free ', it has been found that the cost of effecting the required degree of suppression of existing apparatus or plant is usually but *a small percentage of its original cost.*".

411. It may perhaps be thought that in the present state of industrial development in India, when electrical appliances are not widely used, the problem of eliminating electrical interference does not appear to be so acute as, say, in Great Britain, and that no legislation is therefore necessary in this respect But this is not so The problem of electrical interference in India is considerably more serious than it has ever been in England. The interference due to fans, lifts, trams, industrial motors, etc., is perhaps confined to large towns, but interference is mainly due to the presence of direct current (instead of alternating current) supply over the greater part of electrified India. A commutator type motor must be used with a direct current supply and it is difficult to prevent this type of motor causing interference without suitable appliances In fact the most serious cause of electrical disturbance in India is due to electric fans in D. C areas which are installed in very large numbers and are very often badly maintained.

412. This type of interference, if left unchecked, is enough to ruin the best efforts of a broadcasting organisation. Every listener knows what torture listening in India can become in the summer, perhaps on account of some electric fan (out of the hundreds in the neighbourhood) which eludes detection and whose powers for mischief continue unabated from day to day and from summer to summer Such interference can and should be stopped by the compulsory use of suppression devices and proposals for legislation in this respect are receiving the serious consideration of this Department There is, however, great need for an awakening of public opinion, and listeners as well as dealers and manufacturers should be interested in this question as much as the authorities in charge of broadcasting.

CHAPTER VIII.

RADIO PUBLICATIONS.

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RADIO PUBLICATIONS.

(*i*) *The Indian Listener.*

413. The advance publication of programmes to assist listeners in selecting those items that specially appeal to them is an essential part of the work of a broadcasting organisation. Following in the steps of the BBC, the Indian Broadcasting Company brought out the *Indian Radio Times* at Bombay with a view to making their programmes at Bombay and Calcutta available to the public

414 The *Indian Radio Times*, first published in 1927, was a modest venture The annual subscription was Rs 1-14-0, and a single copy was priced at one anna It was published twice a month and contained the programmes of the Bombay and Calcutta stations in outline, technical articles and notes and a few talks. The circulation of a programme journal is dependent upon the number of listeners, and the failure of broadcasting to expand according to expectations naturally limited the scope of its usefulness. The crisis came early in 1930, and in the 'farewell' issue of 7th February 1930 the Editor announced gloomily · 'Broadcasting in this country will be dead by the end of this month. With its passing away the *Indian Radio Times*, the continuance of which will serve no useful purpose, will become defunct.'

415. The prophecy was not fulfilled Within a month the *Indian Radio Times* was revived. Since then it has not missed a single issue

416 While negotiations for the purchase of the assets of the I.B.C. were in progress, Government authorised the liquidator who was in charge of the Company to carry on the broadcasting service on their behalf. The journal became the official organ of the Indian State Broadcasting Service and continued its career without material change in contents or layout In April 1931 the circulation was 2,750 and till the end of 1932 remained below 3,000. Towards the end of 1932 the BBC started their Empire broadcasting service, whose effect was immediately perceived in India. Licences increased rapidly and the circulation of the *Indian Radio Times* increased with them. At the end of 1934 the circulation stood at 6,000 and by the end of 1935 at 12,000. This remarkable increase was partly due to the decision to include BBC programmes with the programmes of the Bombay and Calcutta stations.

417. This rapid growth in circulation, however, demanded a few important changes. A new layout was adopted and the contents increased by the addition of reading matter and more foreign programmes, and owing to the increased cost of printing, the advertisement tariff had to be revised

418. In December 1935 the name of the journal was changed to the *Indian Listener* and in March 1936, the subscription was increased from Rs. 3 to Rs. 4. Since 1936 the growth of the *Indian Listener* has been closely connected with the development of All India Radio. The opening of the Delhi station increased the circulation by 2,000 in three months and the increase might perhaps have been more marked if a Hindi-Urdu journal, *Awaz* had not been started at the same time. In January 1937 the circulation stood at 16,500 Towards the end of 1937-38, during which year the Peshawar station was taken over and the Lahore station put 'on the air', the circulation stood approximately at 19,000

419 In 1937 it was decided to move the office of the *Indian Listener* from Bombay to New Delhi. The *Indian Radio Times* was published at Bombay at the head office of the Indian Broadcasting Company. But the headquarters of All India Radio were in New Delhi, and the publication of the journal in Bombay was inconvenient from an administrative point of view. In the days of the Indian State Broadcasting Service, the Director of Bombay station was the editor of the *Indian Radio Times*. But the position entailed a type of work and responsibility which the Director of a busy station such as Bombay had not the time to attend to properly.

420. The editorship was, therefore, made an independent charge and a gazetted officer appointed to the post, and in August 1937, after preparations had been made for the printing of the *Indian Listener* at New Delhi, the office was transferred. Delhi, had however, one serious disadvantage. Good printing presses capable of handling such work as the *Indian Listener* are scarce, and until such time as All India Radio can make its own arrangements for printing a growing number of journals, recourse must be had to private presses. The first experiment in printing at Delhi having proved a failure, a change in printers was made early in 1939, and more permanent arrangements are under consideration.

421. In 1938 the opening of new stations at Lucknow and Madras and the introduction of alternative programme from Delhi, Bombay and Calcutta, increased the circulation and the size of the *Indian Listener*. From a magazine of 48 pages in 1937 it grew to 104 pages in December 1938, and the circulation rose from 14,000 in August 1937 to 21,000 in December 1938. However, in 1939, with the change of printers, a new layout was adopted, and the space given to programmes was standardised. Owing to the increased cost of printing and distribution, the subscription was raised in March 1939 from Rs. 4 to Rs. 6 per annum.

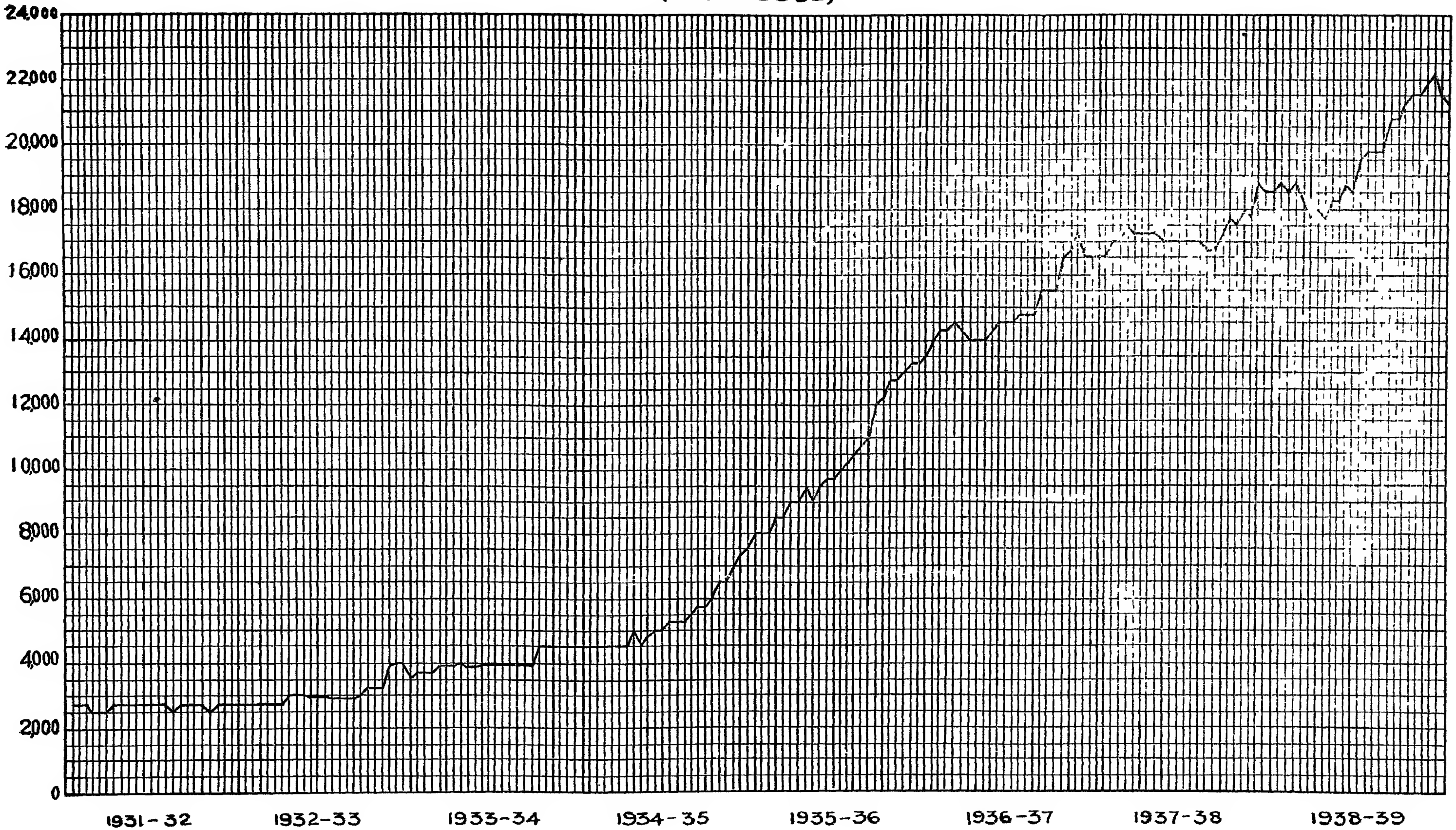
422. Owing to the fact that Delhi is not a commercial centre, considerable difficulties were experienced in securing advertisements and in maintaining contacts with advertising firms. With a view to overcoming these difficulties, representatives of the *Indian Listener* were appointed on a commission basis in Calcutta, Bombay and London. The decline in advertisements, which was experienced in 1938, was arrested, and 1939 showed a remarkable recovery, which was due to the efforts of these representatives as well as to the improved printing.

423. The journal is published a week in advance of the programmes and may be purchased from agents in every important town throughout India or direct by post from the Editor's office. At the time of writing this report, its contents include detailed programmes of Delhi, Bombay, Calcutta. Lahore, Lucknow, Madras and the BBC.* The Indian programmes are annotated wherever possible. Notes from the studios on outstanding items and technical articles and editorial notes are also published.

424. The *Indian Listener* circulates throughout India and to some extent also in Burma and Ceylon. Though its influence is limited to the owners of radio sets, it is, like broadcasting itself, a force making for the cultural unification of India. If in the past more advertisers did not take advantage of the facility offered to them of reaching a high class

*Trichinopoly and Dacca have been added since the 16th May and 16th December 1939 respectively.

CIRCULATION OF THE INDIAN LISTENER
(PER ISSUE)



market throughout India it was because of a self-imposed limitation which restricted the *Indian Listener* to accepting only radio advertisements. This was, however, removed at the suggestion of the Public Accounts Committee towards the end of 1937 and at present the *Indian Listener* accepts practically all classes of advertisements The programmes are copyright and newspapers and journals are not allowed to publish more than two days' programmes at a time.

(*ii*) *Awaz*.

425. *Awaz* was first published on the 1st January 1936 when the Delhi Broadcasting Station was opened. It was published in the two principal scripts of the country, *viz*., Urdu and Devanagri. In the beginning *Awaz* was merely the organ of the Delhi Broadcasting Station and restricted itself to Delhi programmes. The annual subscription was Rs 2 and single copies were sold at two annas each While the number of wireless licences rose from 26.000 to 37,000 in the course of 1936, the circulation rose from 500 to 1,000.

426. Towards the end of 1936, however, it was decided to include Bombay and Calcutta programmes and in consequence the circulation doubled in three months, and went on increasing steadily. Further programmes were added when Peshawar was taken over in April 1937 and Lahore and Lucknow were opened. The circulation at the end of June 1938 stood at 6,000

427. The bilingual character of the journal involved the duplication of programmes and, therefore, a considerable amount of waste, as with the exception of a small portion of households in which both scripts were in demand, the great majority of subscribers found one script completely useless. To eliminate this waste it was decided to publish *Awaz* in two editions—in the Urdu script as *Awaz* and in the Devanagri script as *Sarang*. The two editions first appeared on the 1st July 1938. With a view to centralising the management of the publications, the office of *Awaz* was transferred to the charge of the Editor of the *Indian Listener*. This change has led to the unification of the policy and management of the journals published at Delhi

428. The increased cost of printing owing to the inclusion of the programmes of new stations necessitated a higher subscription, and in July 1938, simultaneously with the bifurcation of *Awaz*, the subscription was raised to Rs 3 per annum.

429 The journal is published every fortnight, a week in advance of the programmes and may be purchased from agents in every important town throughout India or direct by post from the Editor's office. At present the programmes of the following stations are included :

Delhi I, II and III.
Bombay I and II.
Calcutta II only.
Madras II.
Peshawar.
Lahore.
Lucknow.

The programmes for Calcutta II are published in skeleton form and in the case of Madras II, only the wavelength and the times are given.

430. *Awaz* circulates throughout India and to some extent also in Burma and Afghanistan. The present circulation is 5,000—a figure claimed by few Urdu journals in the country.

(*iii*) *Sarang.*

431 The Devanagri section of *Awaz* which was combined with the Urdu section since 1936, first appeared as *Sarang* on the 1st July 1938. The circulation of the first issue was 2,000 ; it has gone up to 2,500 at the time of writing this report

432. The subscription rates of *Sarang* are the same as those of *Awaz*. The contents of *Sarang* and *Awaz* are identical except that the broadcast talks published in *Sarang* are selected from those Hindustani talks which contain more Hindi and Sanskrit and less Persian and Arabic words.

433. *Sarang* circulates throughout India and to some extent in Burma.

(*iv*) *Betar Jagat*

434 In September 1929 the Calcutta Station of All India Radio (then known as the Indian Broadcasting Company) felt the need of publishing a journal of its own in an Indian language. The only existing Radio Journal at that time was the *Indian Radio Times*, the official organ of the Indian Broadcasting Company. This published the programmes of the two Stations then opened (Bombay and Calcutta) but a large number of listeners in Bengal, who did not know English could not derive much benefit out of it. Thus in response to a growing demand for a Bengali magazine it was decided to publish the *Betar Jagat*, with the purpose of getting into closer touch with the listening public.

435. The magazine first appeared on a very small scale with an annual subscription of Rs. 1-14-0. Single copies were sold at an anna each. It was published every fortnight and contained the programmes of the Calcutta Station.*

436 The retail sale of the magazine increased steadily, but the number of regular subscribers was not encouraging. In August 1934 it was decided to make the magazine slightly more ambitious and attractive. Articles of special radio interest, news of the world, more programme details and a few illustrations were included. This increased the cost of printing, and the subscription was raised from Rs. 1-14-0 to Rs. 2. Single copies were sold at two annas instead of one. After this the regular subscription increased rapidly while the retail sale went down.

437. Since 1931, however, there has been a slow but steady increase in its circulation and in the number of registered subscribers.

(*v*) *Vanoli.*

438. Two Journals *Vanoli* in Tamil and *Vani* in Telugu were started simultaneously from the date of the inauguration of the Madras Station of All India Radio on the 16th June 1938. *Vani* had, however, to be dropped after the publication of 6 issues, as experience showed that there was very little demand for a magazine in Telugu. *Vanoli* contains the programmes of the Madras† station in detail and the programmes of Delhi, Bombay and Calcutta (M.W. and S.W.) in skeleton form.

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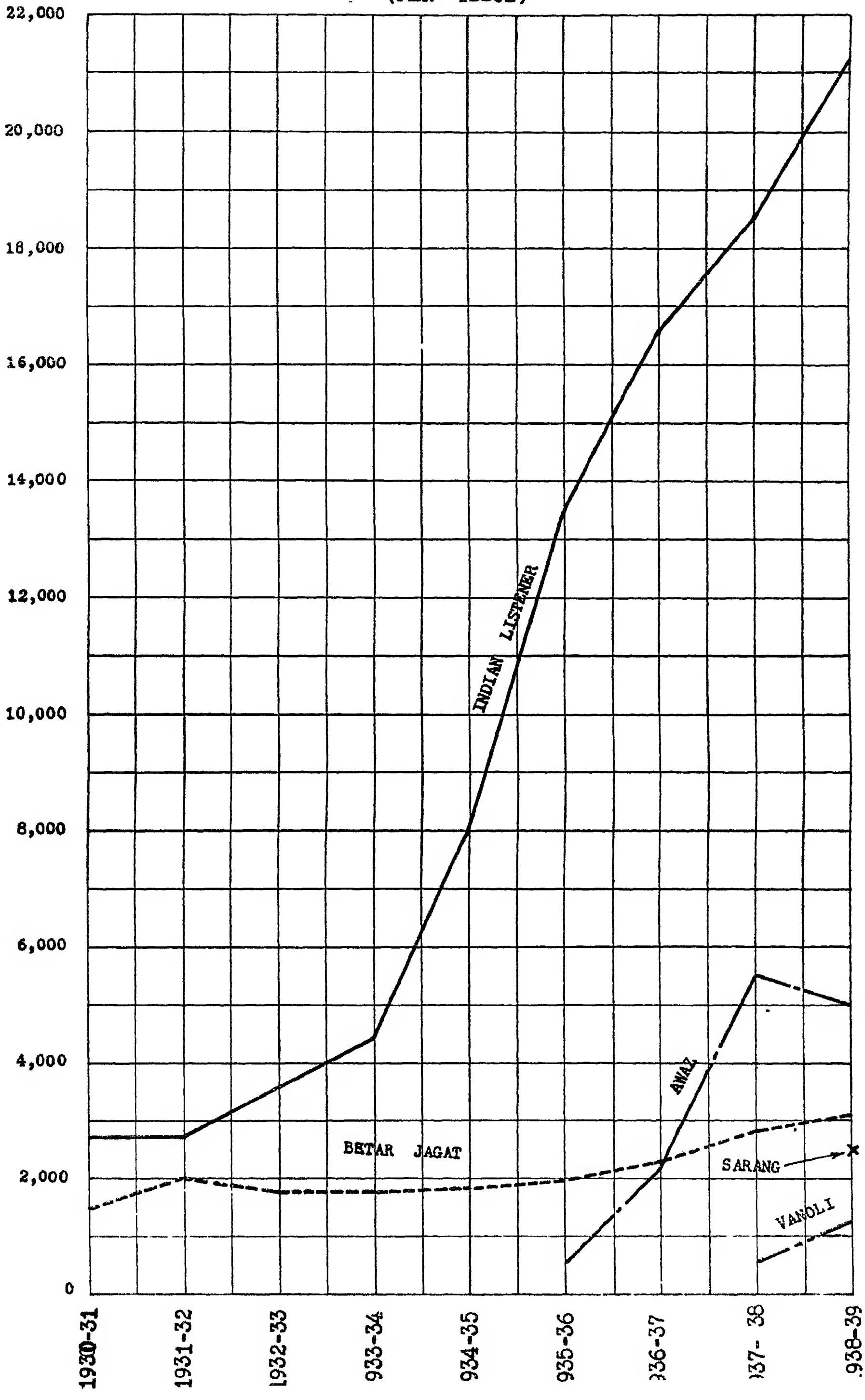
*Dacca has been added since the 16th December 1939.

†Trichinopoly has been added since the 16th May 1939.

CIRCULATION OF RADIO JOURNALS
(PER ISSUE)



(vi) *Subscription and Circulation.*

439. The following tables show the rates of subscription and the growth of circulation of all the Radio Journals :

Rates of subscription of the Radio Journals.

	Indian and Ceylon.		Burma.		Foreign.	
	Annual.	Single copy.	Annual.	Single copy.	Annual.	Single copy.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Indian Listener..	6 0 0	0 4 6	8 0 0	0 6 0	12 0 0	0 8 0
Awaz ..	3 0 0	0 2 6	4 0 0	0 3 0	6 0 0	0 5 0
Sarang ..	3 0 0	0 2 6	4 0 0	0 3 0	6 0 0	0 5 0
Betar Jagat ..	2 0 0	0 2 0	3 0 0	0 2 6	4 0 0	0 4 0
Vanoli ..	2 0 0	0 2 0	3 0 0	0 2 6	5 0 0	0 4 0

Circulation figures per issue.

Year.	*Indian Listener.*	*Awaz.*	*Sarang.*	*Betar Jagat.*	*Vanoli.*
1930-31	2,750	..	..	1,520	..
1931-32	2,750	..	..	2,000	..
1932-33	3,600	..	..	1,700	..
1933-34	4,500	..	..	1,700	..
1934-35	8,000	..	..	1,750	..
1935-36	13,500	500	..	1,900	..
1936-37	16,500	2,190	..	2,400	..
1937-38	18,500	5,500	..	2,800	500*
1938-39	21,250	5,000†	2,500	3,100	1,250

(vii) *Finances.*

440. A statement regarding the finances of the journals is given in Appendix III and commented upon in Chapter VI (para. 342).

*Initial circulation.

†Bifurcation from 1st July 1938.

CHAPTER IX.

STATE ACTIVITIES AND INDEPENDENT STATIONS.

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STATE ACTIVITIES AND INDEPENDENT STATIONS.

(I) *Stations in Indian States.*

441. (*i*) *Baroda.*—As early as 1935, the Baroda Government evinced an interest in broadcasting by proposing to install a radio station within their territories as part of their rural uplift scheme. They deputed, with the concurrence of the Government of India, the Telephone Superintendent of the Durbar to Peshawar to study the working of the rural broadcasting system inaugurated there by the Government of the N. W. F. P. In 1938 the Baroda Government drew up alternative schemes for the establishment of a service in the State, and All India Radio, at their request, examined and advised upon them*.

442 (*ii*) *Mysore.*—The " Akashvani " Broadcasting station at Mysore was formally opened on the 10th September 1935 by Dr. Metcalfe, Vice-Chancellor of the University of Mysore. The programme consisted chiefly of Carnatic Music and talks on various topics of popular interest. The talks were given as far as possible in Indian languages, as this station was intended mainly for mass education The station which has a power of 0·25 K.W., works daily (except Sundays) from 6-00—8-30 P.M. I.S T.

443. (*iii*) *Travancore.*—Early in 1936 the Trade Agent for Travancore State at Bombay consulted the Controller of Broadcasting with a view to drawing up a comprehensive scheme of broadcasting for Travancore State. H. H. the Maharaja of Travancore evinced great interest in the subject and a Committee was formed of responsible officials in the State to advise on the possibilities of erecting a transmitter at a suitable site in Trivandrum in the State. Advice was sought through correspondence on almost all aspects of broadcasting and detailed information was given. An Engineer from Travancore was subsequently sent to Delhi for training in installation work in the Installation Department of All India Radio. Four assistants were also given training The Chief Engineer, All India Radio, visited Travancore State in January 1939 in an advisory capacity to the Government of Travancore, and after discussion, the Government of Travancore decided to proceed with the establishment of a broadcasting centre at Trivandrum. A 5 K.W. Mediumwave transmitter will be installed.

444. (*iv*) *Hyderabad.*—The Government of H. E. H. the Nizam have at present two stations under construction at Hyderabad and at Aurangabad. The former, which will operate on a wavelength of 411 metres, is of 4|5 K.W. power and the latter of 0·25 power on a wavelength of 319 metres. Information regarding the staff employed and the general arrangements in force at the Delhi Station was supplied by A. I. R. to the Government of H. E. H. The Nizam.

445. (*v*) *Gwalior.*—Advice has been sought by the Gwalior Durbar regarding the establishment of broadcasting stations in the State. The scheme has been discussed by the Controller of Broadcasting and the Chief Engineer with a representative of the State.

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*The foundation stone of the Baroda Broadcasting Station was laid by H H. The Gaekwar on the 1st May, 1939.

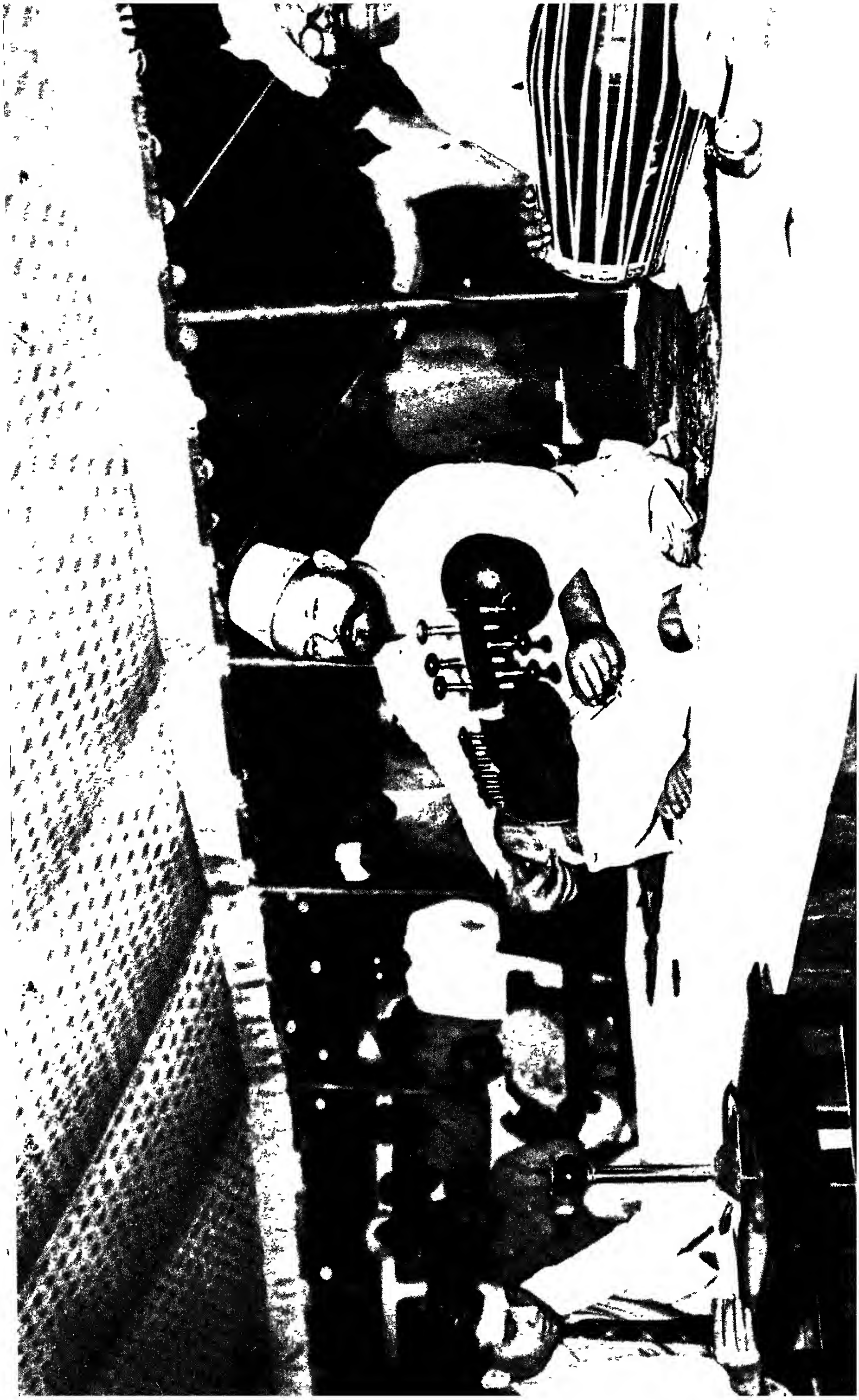
(II) *Independent Stations.*

446. (*vi*) *Experimental Station at Allahabad.*—The Principal of the Agricultural Institute, Allahabad, was granted an 'experimental broadcasting licence' in January 1935 which was subsequently renewed up to 31st December 1936 and further renewed up to 21st December 1938. The programmes are primarily intended for rural listeners and are radiated for one hour each evening on a wavelength of 204·8 metres. The transmitter has a power of 100 watts.

447. (*vii*) *Dehra Dun Broadcasting Association.*—In order to broadcast rural programmes to serve a radius of 20-30 miles from Dehra Dun, Mr. B. J. K. Hallowes, Superintendent of the Doon, with the permission of the Government of the United Provinces, collected funds amounting nearly to Rs. 45,000 by local subscription and sought the permission of the Government of India for a licence for the installation of a station at Dehra Dun. The apparatus and installation cost about Rs. 17,000 and the building (excluding land) about Rs. 4,000. Twenty-two receiving sets were installed in different villages of the District. The material for broadcast was obtained from the Rural Development Committees and different Departments of Government. The Government of India, at the instance of the Government of the United Provinces, granted a licence and broadcasting commenced on the 6th April 1936 and was conducted for about 1¼ hours between 7-30—8-45 P.M. under the supervision of Mr. J. E. C. Turner, an officer of the Imperial Forest Service. The Station, however, closed down on the 10th May 1938 owing to lack of funds.

448. (*viii*) *Peshawar Station*—In 1935, the Marconi Company offered to the Government of the N W. F. P. the free loan of a transmitter and some village sets on the understanding that they would be purchased after a year's trial. Community sets were installed in 14 villages in the Peshawar District. Subsequently 35 sets in Schools and Government Departments, and 15 sets across the border in States and Agencies were installed At the request of the Government of the N. W. F. P., the Government of India took over the station with effect from the 1st April 1937.

449. (*ix*) *Madras Corporation Broadcasting Station.*—The Madras Broadcasting Service was initiated on the 31st July 1924 in the city of Madras by the Madras Presidency Radio Club The transmitter was of 40 watts power with a reliable range of about 5 miles. The club carried on its work till October 1927 when it was wound up owing to financial difficulties and the transmitter was presented to the Corporation of Madras. The Corporation obtained a licence for broadcasting and a regular service was started on the 1st April 1930. Musical Programmes were broadcast in the evenings from 5-30 to 7-30 P.M. and music lessons and stories were broadcast on school days from 4-00 to 4-30 P.M. In addition to the daily programme in the evenings, gramophone music was broadcast in the mornings from 10 to 11 A.M. on Sundays and public holidays. European Music was broadcast on one Monday each month from 5-30 to 7-30 P.M. Six radio loud speaking equipments were installed at the Marina, Robinson Park, Spur Tank, Panagal Park, Peoples Park and High Court Beach, and were in operation in the evenings. Fourteen Corporation schools were also equipped with small indoor sets for the benefit of children. The Corporation ceased to broadcast programmes with effect from the 16th



June 1938 on which day new medium and short wave stations in Madras were inaugurated by All India Radio

450. (x) *Lahore Y. M C. A. Broadcasting Station*—In 1928 a small transmitting station was established by the Y. M. C A. at Lahore Its running costs were met by an annual grant of Rs 1.500 from the Punjab Text Book Committee and by other grants from the Punjab Government. In 1936 the Y. M. C. A. asked for financial assistance to enable them to renovate the station and carry on until the All India Radio station at Lahore was established On the recommendation of the Controller, the Punjab Government contributed Rs. 600, and the Government of India Rs. 800, towards the programme expenditure and technical maintenance. The Station closed down on the 1st September 1937. The new 5 K.W. mediumwave Station of All India Radio was opened on December 16, 1937.

APPENDICES.
(I—XV.)

APPENDIX I.

PRINCIPAL FIGURES.

Total Number of all types of Licences in force on the 31st March 1939		78,895
Gross Licence fees for 1938-39	Rs.	7,50,261
Gross Customs Revenue for 1938-39	Rs.	13,70,320
Number of sets imported during 1938-39		28,115
Number of stations in operation during 1938-39		7
Number of transmitters in operation during 1938-39 ..		12
Total Programme Transmission Hours during 1938-39—		
M. W.	Hrs.	16,670
S. W.	Hrs.	13,189
Circulation of Radio Journals on 31st March 1939		33,100
Capital expenditure up to end of 1938-39	Rs.	23,88,067
Recurring Budget for 1938-39	Rs.	22,32,000
Expenditure on programmes, 1938-39	Rs.	6,36,142

Staff strength on the 31st March 1939—

	Head-quarters.	Subordinate Offices.	Total.
Officers	4	147	151
Clerical	49	109	158
Total ..	53	256	309

APPENDIX II.

STATISTICS ON THE COMPOSITION OF PROGRAMMES FOR 1937-38. (TIME IN MINUTES).

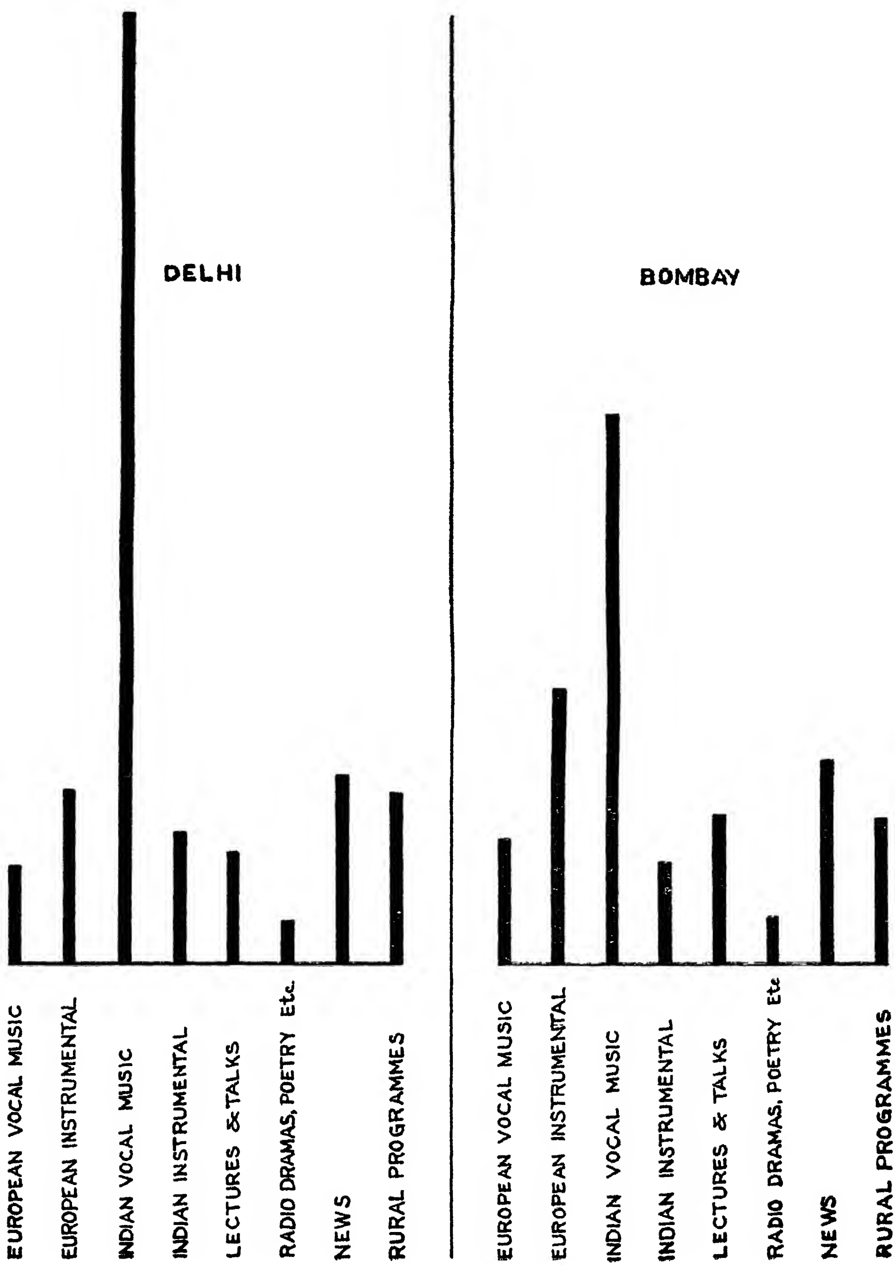
	European Vocal Music.				European Instrumental Music.				Indian Vocal Music.			
	Delhi.	Bombay.	Calcutta.	Pesha-war.	Delhi.	Bombay.	Calcutta.	Pesha-war	Delhi.	Bombay.	Calcutta.	Pesha-war.
May 1937	198	4,155	1,094	60	767	120	2,467	615	5,453	4,481	4,056	2,328
June "	253	380	812	65	772	3,380	2,251	494	5,263	5,215	3,995	3,148
July "	324	1,290	888	10	776	2,685	2,436	424	6,222	5,195	4,008	3,545
August "	272	775	1,098	.	808	2,660	2,432	540	7,403	5,370	4,248	5,134
September "	579	620	812	25	1,281	3,570	2,251	487	7,823	5,271	4,007	5,144
October "	913	500	1,375	30	2,559	3,605	2,305	526	7,472	5,528	3,983	5,310
November "	905	855	1,257	45	2,395	3,165	1,885	561	9,484	4,360	3,855	5,453
December "	1,549	3,400	1,094	55	1,850	480	2,553	557	10,501	3,407	4,174	5,735
January 1938	1,650	430	1,151	57	1,962	2,720	2,027	607	12,258	3,700	4,124	6,041
February "	1,430	270	1,136	320	1,975	2,415	1,749	71	11,101	6,875	3,596	7,370
March "	1,550	242	530	30	2,298	3,014	2,340	396	12,537	6,409	4,026	4,311
Total Time in Minutes	9,623	12,917	11,247	697	17,443	27,814	24,696	5,278	95,517	55,811	44,072	53,519
Do. in Hours	160·3	215·3	187·5	11·6	290·7	463·6	411·6	88·0	1,591·9	930·2	734·5	892·0

PROGRAMME COMPOSITION AT THE STATIONS

(IN HOURS)

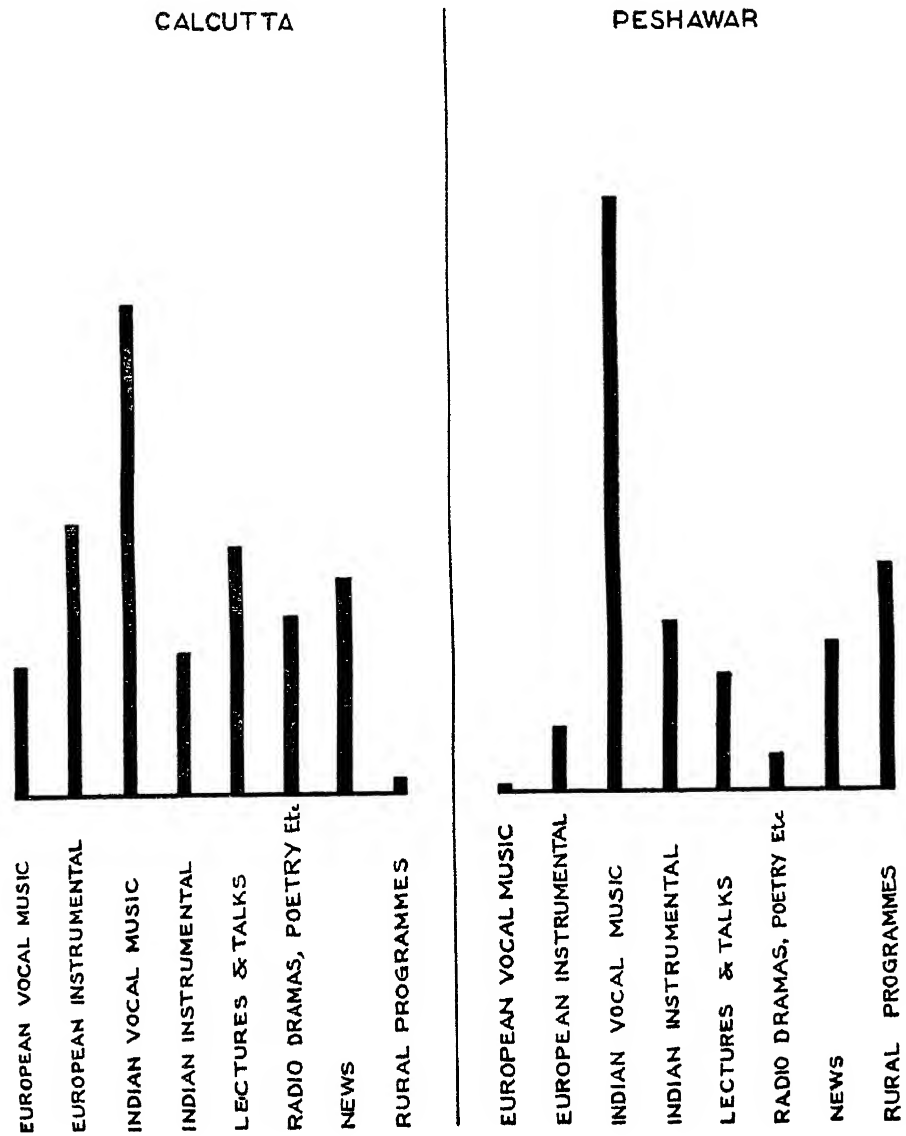
MAY 1937 — MAR 1938

1″ = 355 Hrs.



PROGRAMME COMPOSITION AT THE STATIONS
(IN HOURS)
MAY 1937 – MAR 1938

1″ = 355 Hrs.



STATISTICS ON THE COMPOSITION OF PROGRAMMES FOR 1937-38. (TIME IN MINUTES)—*contd.*

	Indian Instrumental Music.				Lectures and Talks.				Radio Dramas, Poetry, etc.			
	Delhi.	Bombay.	Calcutta.	Peshawar.	Delhi.	Bombay.	Calcutta.	Peshawar.	Delhi.	Bombay.	Calcutta.	Peshawar.
May 1937	1,337	485	1,145	2,504	860	990	2,010	725	370	685	1,482	400
June "	1,170	570	1,124	1,222	870	1,535	2,053	611	205	525	1,359	135
July " .. .	1,270	630	1,165	1,431	919	1,380	2,116	583	323	735	1,405	233
August " . ..	1,125	670	1.177	1,387	965	1,150	2,065	911	272	525	1,495	95
September "	1,198	590	1,125	1,448	886	915	1,976	918	265	240	1,496	..
October "	966	585	1,135	1,470	970	1,317	2,112	976	331	605	1,676	300
November " .. .	794	480	1,154	1,481	1,194	1,160	2,114	938	540	375	1,464	250
December "	1,333	585	1,156	1,596	1,317	1,795	2,113	1,045	496	340	1,408	258
January 1938	1,523	1,800	1,105	1,567	1,137	3,235	2,101	1,133	292	485	1,292	572
February "	1,560	1,260	1,015	498	1,002	1,020	1,920	999	408	445	1,273	271
March "	989	2,722	1,205	567	1,011	1,038	2,065	1,407	449	252	1,615	286
Total Time in Minutes ..	13,265	10,377	12,506	15,171	11,131	15,535	22,645	10,246	3,951	5,212	15,965	2,800
Do. in Hours ..	221·1	173·0	208·4	252·9	185·5	258·9	377·4	170·8	65·9	86·9	266·1	46·7

STATISTICS ON THE COMPOSITION OF PROGRAMMES FOR 1937-38. (TIME IN MINUTES)—*contd.*

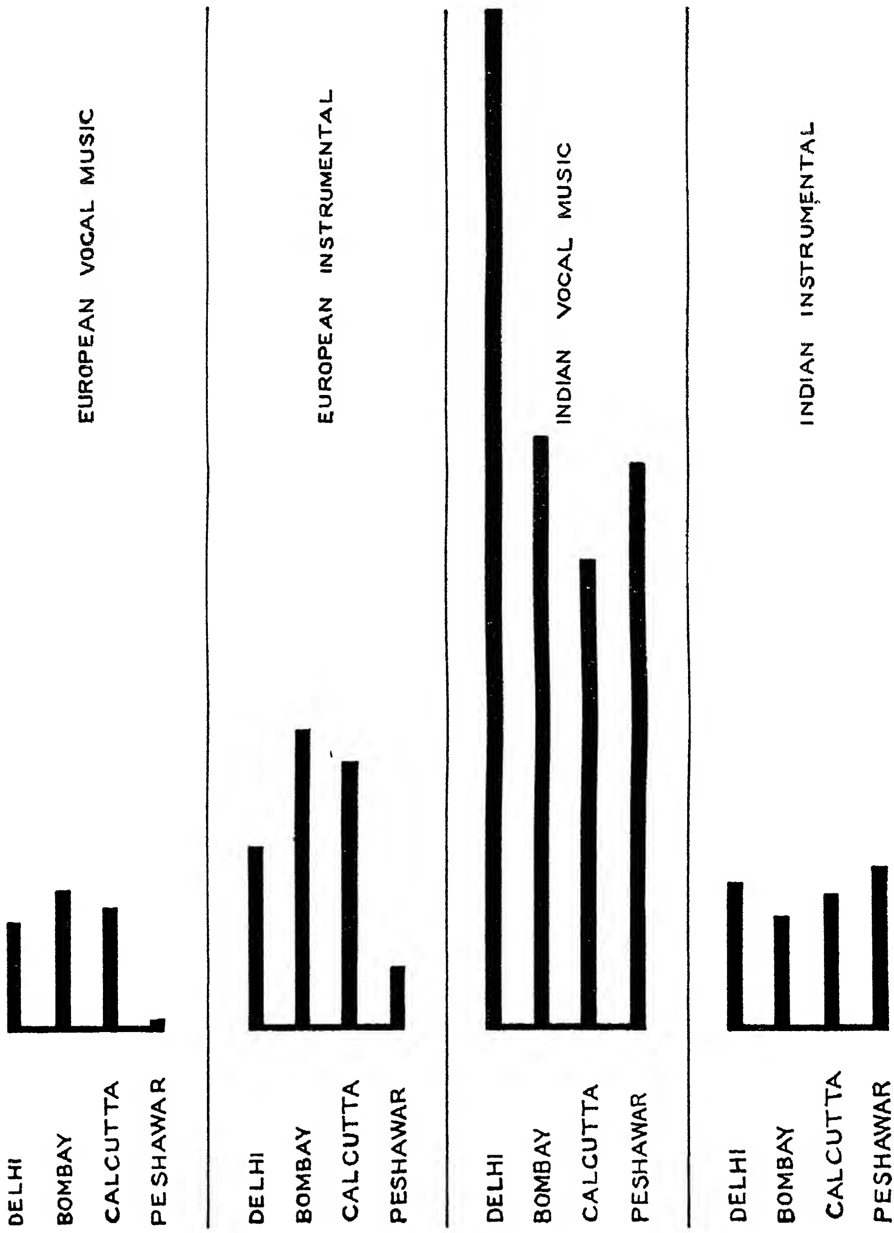
	News.				Rural Programmes.			
	Delhi.	Bombay.	Calcutta.	Peshawar.	Delhi.	Bombay.	Calcutta.	Peshawar
May 1937	1,982	1,985	1,905	1,386	1,316	1,500	455	Details not available.
June "	1,679	1,570	2,039	1,048	1,333	1,560	.	
July "	1,512	1,580	2,344	1,075	1,395	1,590	235	
August "	1,555	2,330	1,482	1,423	1,460	1,295	505	
September "	1,616	1,975	1,583	1,330	1,504	1,560	..	
October "	1,707	1,900	1,762	1,334	1,856	1,560	.	
November "	1,662	1,805	1,574	975	1,740	1,500	.	
December "	1,940	2,125	1,796	1,238	1,856	1,375	.	
January 1938	1,880	1,915	1,737	1,262	1,860	1,500	.	
February "	1,769	2,060	1,502	1,158	1,680	1,440	..	
March "	2,070	1,883	1,613	1,128	1,740	..	.	
Total Time in Minutes ..	19,372	21,128	19,337	13,357	17,740	14,880	1,195	20,400
Do. in Hours ..	322·9	352·1	322·3	222·6	295·7	248·0	19·9	340·5

PROGRAMME COMPOSITION AT THE STATIONS

(IN HOURS)

MAY 1937 - MAR 1938

1" = 355 Hrs.

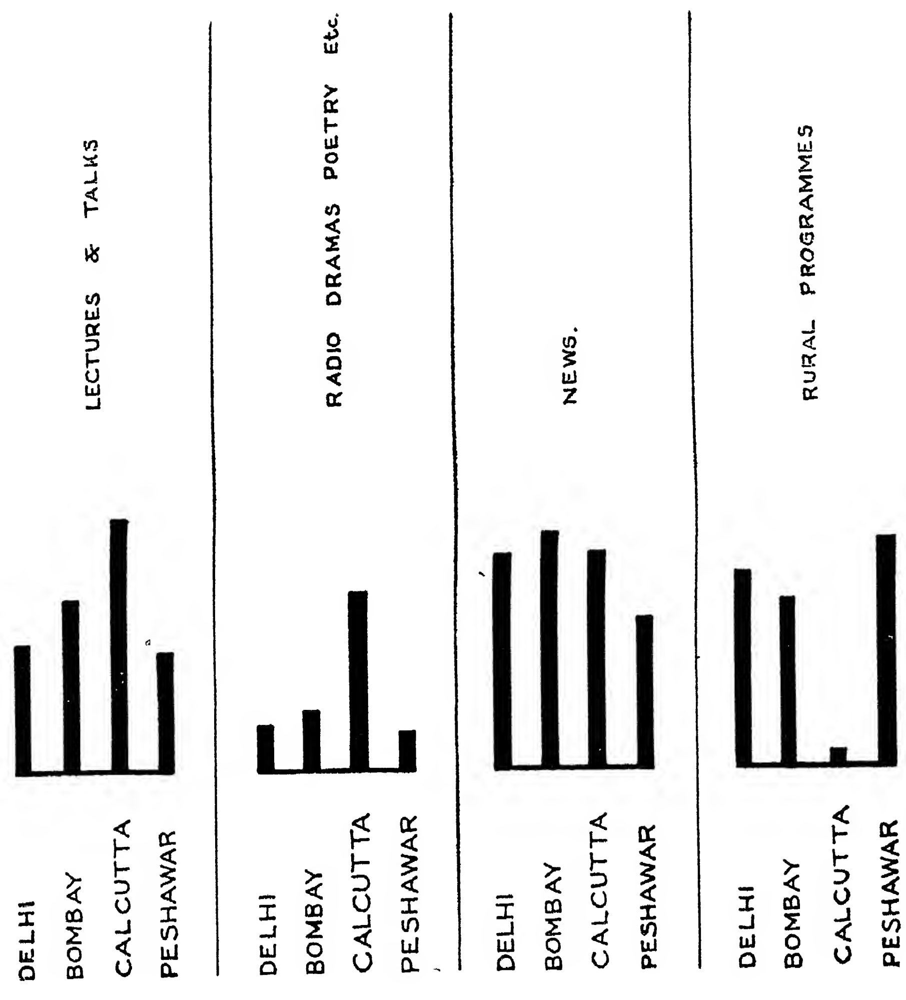


PROGRAMME COMPOSITION AT THE STATIONS

(IN HOURS)

MAY 1937 — MAR 1938

1″ = 355 Hrs.



PROGRAMME COMPOSITION AT THE STATIONS OF A. I. R.

(IN HOURS.)

(MAY 1937—MARCH 1938.)

Programme.	Delhi	Bombay	Calcutta.	Peshawar.	Total.	Remarks.
1. European Vocal Music	160 3	215·3	187·5	11·6	574·7	
2. European Instrumental Music	290·7	463·6	411·6	88·0	1,253·9	
3. Indian Vocal Music	1,591·9	930·2	734·5	892·0	4,148·6	
4. Indian Instrumental Music	221·1	173·0	208·4	252·9	855·4	
5. Lectures and Talks	185·5	258·9	377·4	170·8	992·6	
6. Radio Dramas, Poetry, etc.	65·9	86·9	266·1	46·7	465·6	
7. News	322·9	352·1	322·3	222·6	1,219·9	
8. Rural Programmes	295·7	248·0	19·9	340·5	904·1	
Total ..	3,134·0	2,728·0	2,527·7	2,025·1	10,414·8	

PROGRAMME COMPOSITION, 1938-39. (TIME IN MINUTES).

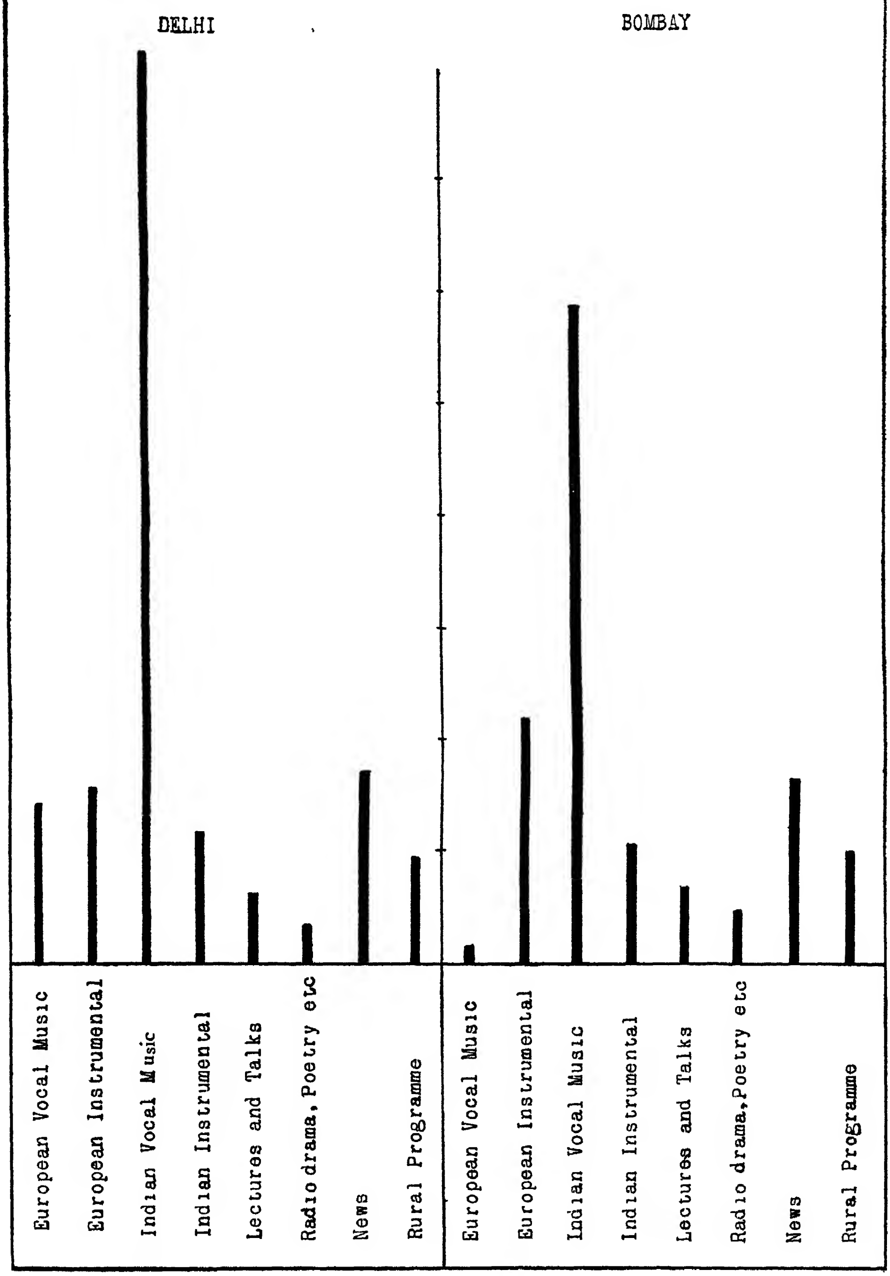
	European Vocal Music.							European Instrumental Music.						
	Delhi.	Bombay.	Calcutta.	Madras.	Lahore.	Peshawar.	Lucknow.	Delhi.	Bombay.	Calcutta.	Madras.	Lahore.	Peshawar.	Lucknow.
1938.														
April	1,730	236	1,018	..	..	..	38	2,019	3,097	2,314	..	142	238	218
May	1,765	204	1,092	..	23	..	77	2,176	2,681	2,467	..	90	128	..
June	1,668	103	1,124	200	30	184	..	2,075	3,067	2,572	424	96	122	4
July	2,002	100	1,075	740	116	120	..	2,260	2,960	2,254	530	62	62	..
August ..	2,065	183	1,173	356½	39	240	25	2,355	2,177	2,083	965½	152	62	..
September ..	1,685	891	1,168	267	65	60	14	2,007	2,234	2,175	967	69	171	..
October ..	1,950	113	1,155	207½	58	180	..	1,969	2,958	2,390	1,134½	108	.	27
November ..	1,890	159	965	252	13	286	..	1,923	2,875	2,280	1,372½	195	12	27
December ..	2,039	221	936	354	55	284	54	1,645	3,066	2,313	1,873½	159	..	26
1939.														
January ..	1,752	93	842	194	21	121	..	1,811	2,821	2,505	690	162	10	39
February ..	1,449	76	799	178	..	58	73	1,578	2,281	2,250	1,233	113	..	16
March ..	1,650	147	650	1,214	..	..	109	1,784	2,745	1,695	415	222	..	90
Total Time in Minutes.	21,645	2,526	11,997	3,963	420	1,533	390	23,602	32,962	27,298	9,605	1,570	805	447
Do. in Hours	360·8	42·1	200	66·1	7·00	25·6	6 5	393·4	549·4	455 0	160·1	26 2	13·4	7·5

PROGRAMME COMPOSITION AT THE STATIONS

(In hours)

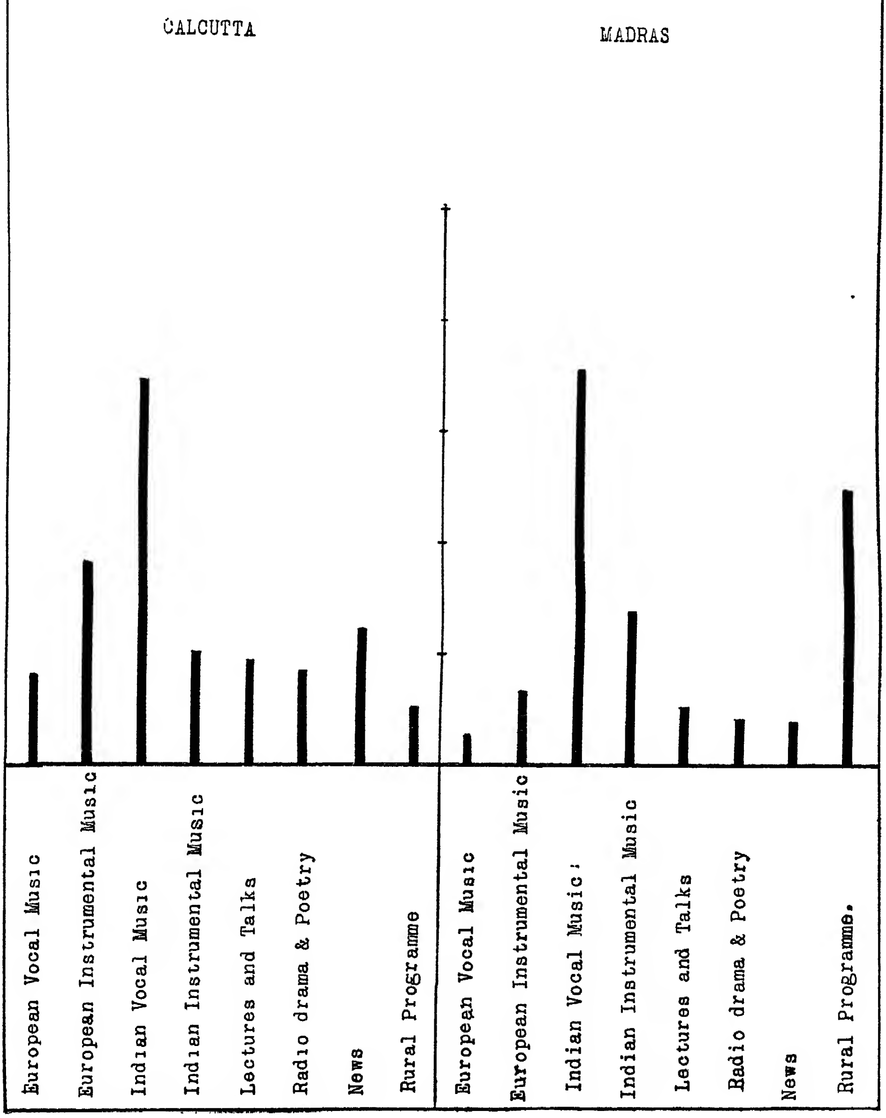
1938-39

1" = 444 Hrs



PROGRAMME COMPOSITION AT THE STATIONS
(In hours)
1938-39

1" = 444 Hrs.



PROGRAMME COMPOSITION, 1938-39. (TIME IN MINUTES)—*contd.*

	Indian Vocal Music.							Indian Instrumental Music.						
	Delhi.	Bombay.	Calcutta.	Madras.	Lahore.	Pesha-war.	Luck-now.	Delhi.	Bombay.	Calcutta.	Madras.	Lahore.	Pesha-war.	Luck-now.
1938.														
pril	9,043	5,145	4,078	..	6,159	5,645	4,451	1,320	750	1,176	..	546	1,265	1 149
ay	9,672	8,012	3,749	..	7,132	6,513	5,573	1,277	715	1,267	..	732	1,216	811
une	8,654	7,916	3,678	2,100	5,077	4,807	5,602	1,812	1,424	1,282	1,544	608	1,072	502
uly	10,330	7,380	3,566	6,804	5,485	5,505	5,743	1,683	1,660	1,213	925	556	1,035	722
ugust ..	10,757	8,792	4,469	6,533	4,292	5,434	5,832	2,028	2,954	1,357	981	375	1,126	564
eptember ..	10,152	6,220	4,395	6,842	5,476	5,095	5,089	1,764	2,342	1,311	1,197	640	1,013	852
ctober ..	11,086	6,731	4,540	5,704½	4,973	4,758	6,533	1,438	1,926	1,580	4,378½	435	1,433	632
ovember ..	10,727	7,650	4,449	4,951	4,751	5,074	6,328	1,423	1,168	1,350	2,662	533	779	456
ecember ..	12,110	8,937	4,792	4,419½	5,162	4,371	7,061	1,302	..	1,376	1,790½	610	1,307	626
1939.														
anuary ..	10,939	7,342	4,408	4,705	4,450	4,534	7,314	1,210	978	1,080	3,196	839	1,275	423
ebruary ..	9,139	6,494	3,948	4,587	4,277	2,931	6,301	1,106	827	993	2,621	561	809	620
arch ..	9,944	8,084	5,660	7,083	5,458	623	6,588	1,470	1,012	1,184	1,222	473	352	709
otal Time in Minutes.	122,553	88,703	51,822	53,729	62,692	55,290	72,415	17,833	15,756	15,169	20,517	6,908	12,682	8,066
o. in Hours ..	2,042·6	1,478·4	863·7	895·5	1,044·9	921·5	1,206·9	297·2	262·6	252·8	342·0	115·1	211·4	134·4

PROGRAMME COMPOSITION, 1938-39. (TIME IN MINUTES)—*contd.*

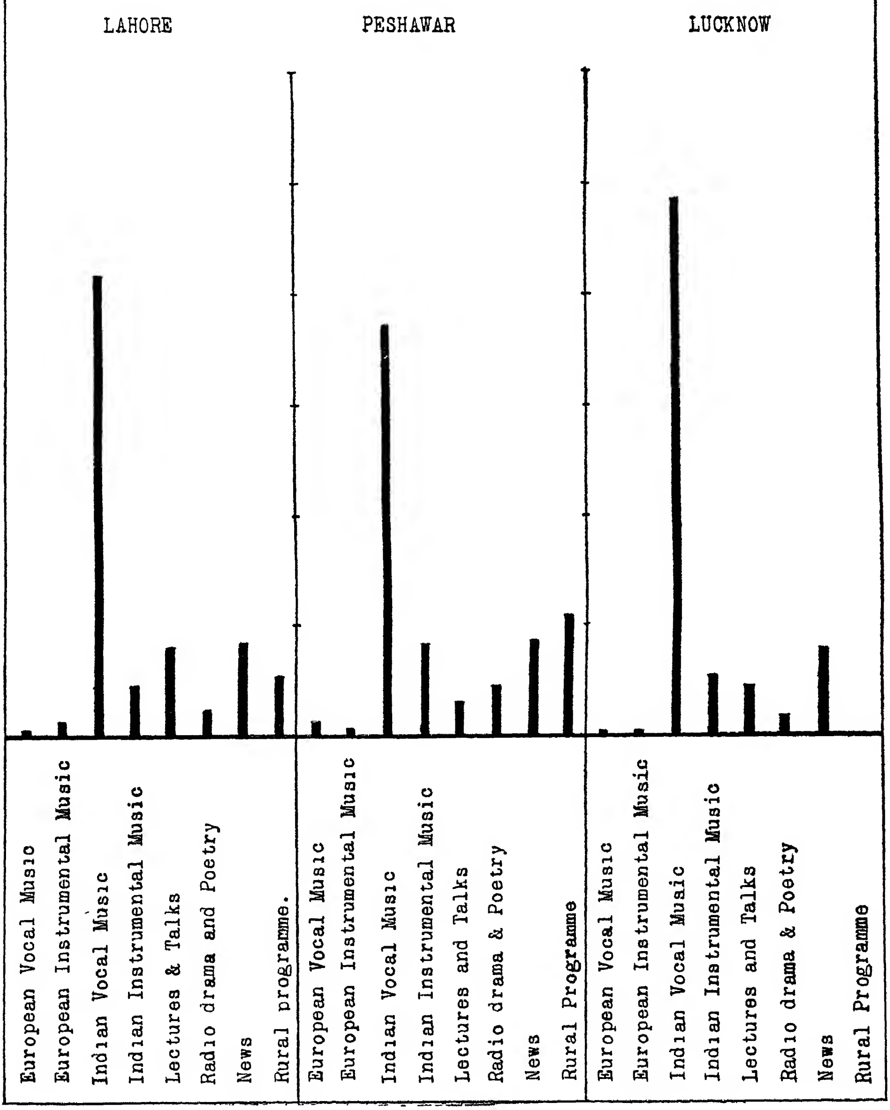
	Lectures and Talks.							Radio Dramas and Poetry.						
	Delhi.	Bombay.	Calcutta.	Madras.	Lahore.	Peshawar.	Lucknow.	Delhi.	Bombay.	Calcutta.	Madras	Lahore.	Peshawar.	Lucknow.
1938.														
April .. .	813	880	2,040	..	744	1,021	732	505	790	1,527	..	225	464	258
May	874	764	2,165	..	779	1,318	578	370	372	525	..	120	785	97
June	930	862	1,270	426	848	386	611	531	310	1,450	190	203	465	206
July .. .	787	1,037	1,282	808	669	130	549	688	391	1,300	249	219	816	138
August ..	756	718	1,073	895	433	124	470	405	660	1,173	464	262	679	221
September .	854	910	1,060	860	406	176	511	607	759	935	718	265	613	238
October ..	731	842½	1,085	751	871	295	518	320	411	1,120	488	357	587	249
November ..	781	1,004	995	751	1,099	511	549	356	504	975	710	179	510	279
December ..	878	876	1,060	831½	981	465	565	356	382	1,185	1,002½	318	568	450
1939.														
January ..	845	763	1,005	770	789	543	555	453	283	1,050	1,193	419	755	219
February .	1,017	1,175	925	671	758	769	620	562	262	690	769	497	699	225
March ..	790	611	405	645	638	375	530	379	422	830	342	356	161	154
Total Time in Minutes	10,056	10,442½	14,365	7,408½	9,015	6,113	6,788	5,532	5,546	12,760	6,125½	3,520	7,102	2,784
Do. in Hours	167·6	174 0	239·4	123 5	150·3	101 9	113 1	92·2	92·4	212·7	102 1	58·7	118·4	46·4

PROGRAMME COMPOSITION AT THE STATIONS

(In hours)

1938-39

1" = 444 Hrs

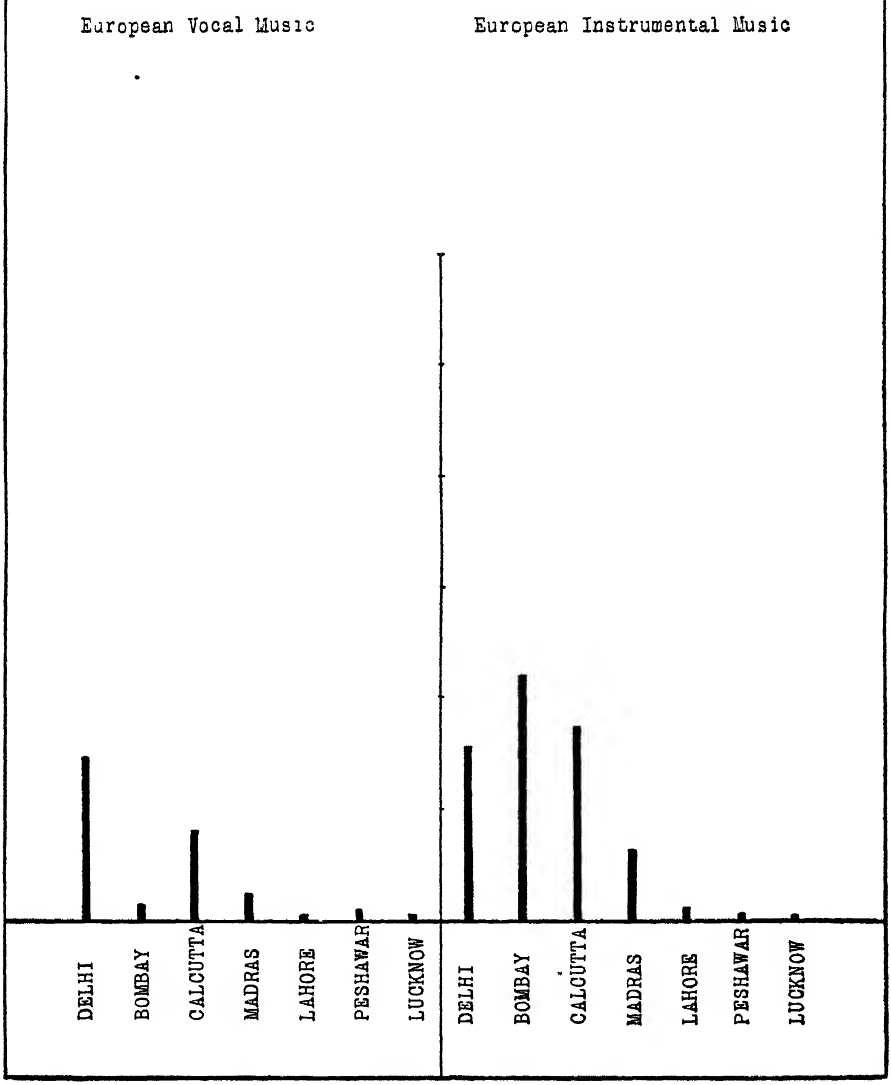


PROGRAMME COMPOSITION AT THE STATIONS

(In hours)

1938-39

1″ = 444 Hrs



PROGRAMME COMPOSITION, 1938-39 (TIME IN MINUTES)—*contd.*

	News.							Rural Programmes.						
	Delhi.	Bombay.	Calcutta.	Madras.	Lahore.	Peshawar.	Lucknow.	Delhi	Bombay.	Calcutta	Madras	Lahore.	Peshawar.	Lucknow
1938.														
April	2,023	1,764	1,536	..	946	1,474½	891	1,800	1,515	.	.	..	..	..
May	1,838	1,521	1,446	..	1,015	1,064	953	1,350	1,560			..	..	..
June	2,012	1,353	1,640	197	953	1,186	920	.	.	.	.	..	.	..
July	1,833	1,497	1,883	590	981	1,060	974	930	1,172	480	.		1,814	..
August ..	1,883	2,032	1,373	505	976	1,116	966	916	1,185	.	..	894	1,876	..
September ..	2,603	2,218½	1,562	505½	1,020	1,176	1,069	852	1,014	1,020		900	1,798	..
October ..	2,317	1,408½	1,310	569	1,077	1,097	974	1.170	1,455	1,068	.	796	1,790	..
November .	2,249	3,105	1,467	535	1,009	1,099	982	1,348	1,560	848	802½	835	1,800	..
December ..	2,349	2,892	1,553	538	1,109	1,200	1,088	1,843	1,620	1,060	627⅓	953	1,810	..
1939.														
January ..	2,388	1,608	1,493	840	1,057	1,178	1,014	1,630	1,320	1,005	764	1,155	1,874	..
February ..	2,103	4,258	1,474	668	991	1,065	899	1,441	1,200	885	709	1,173	1,680	..
March ..	2,336	1,162	1,278	721	1,055	397	906	1,170	1,380	1,080	811	1,400	1,800	..
Total Time in Minutes.	25,934	24,819	18,015	5,668½	12,149	13,112½	11,636	14,450	14,981	7,446	3,713¾	8,106	16,242	*Nil*
Do. in hours	432 2	413·7	300·3	94·5	202 5	218·5	193 9	240 8	249·7	124 1	61·9	131 8	270·7	*Nil*

PROGRAMME COMPOSITION AT THE STATIONS OF A. I. R.

(IN HOURS.)

1938-39.

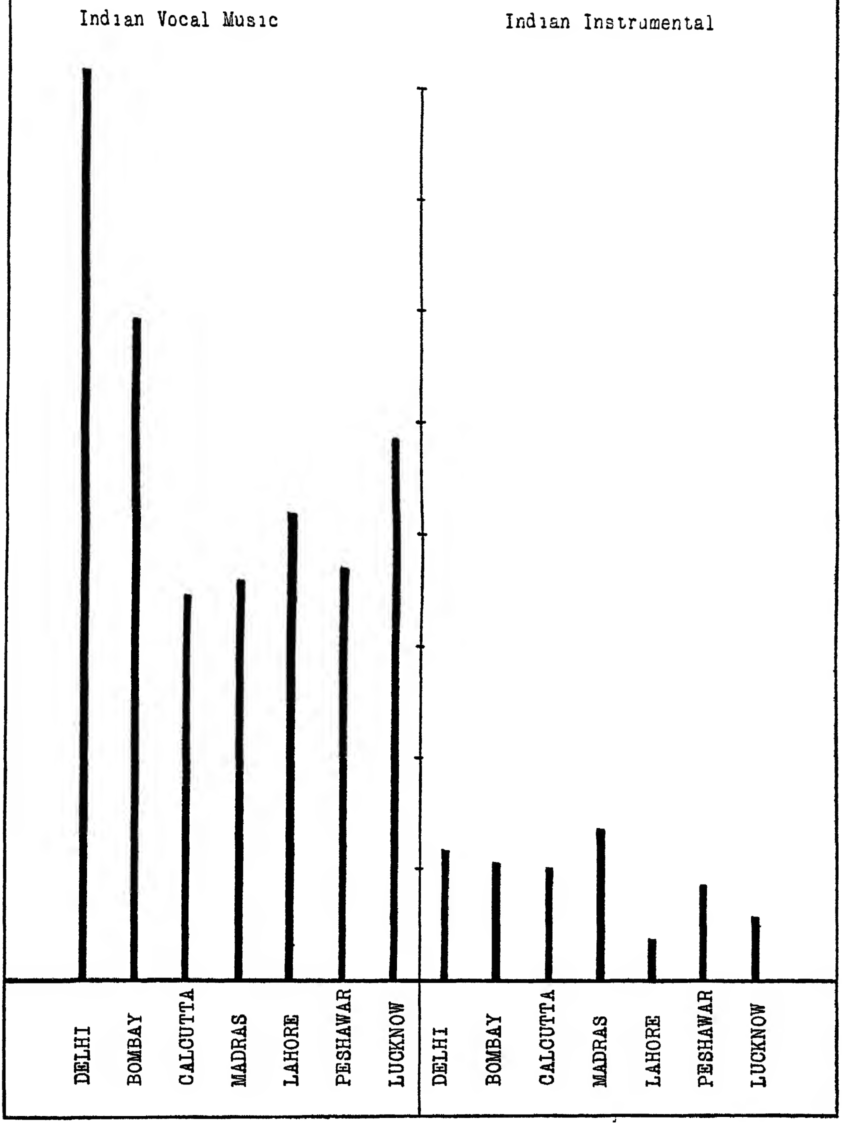
Programme.	Delhi.	Bombay	Calcutta	Madras	Lahore	Peshawar.	Lucknow.	Total
1. European Vocal Music	360 8	42·1	200 0	66 1	7 0	25 6	6·5	708·1
2. European Instrumental Music . .	393·4	549 4	455 0	160 1	26 2	13·4	7·5	1 605 0
3. Indian Vocal Music	2,012 6	1,478 4	863 7	895 5	1,044·9	921·5	1 206 9	8,453 5
4. Indian Instrumental Music	297 2	262 6	252 8	342 0	115 1	211·4	134·4	1,615·5
5. Lectures and Talks	167 6	174·0	239 4	123 5	150 3	101·9	113·1	1,069·8
6. Radio Drama and Poetry	92 2	92 4	212 7	102 1	58·7	118 4	46·4	722·9
7. News	432·2	413 7	300·3	94·5	202 5	218·5	193·9	1,855 6
8. Rural Programmes	240·8	249·7	124 1	61·9	131·8	270·7	*Nil*	1,079·0
Total .	4,026 8	3,262 3	2,648·0	1,845 7	1,736·5	1,881·4	1,708·7	17 109 4

PROGRAMME COMPOSITION AT THE STATIONS

(In hours)

1938-39

1" = 444 Hrs

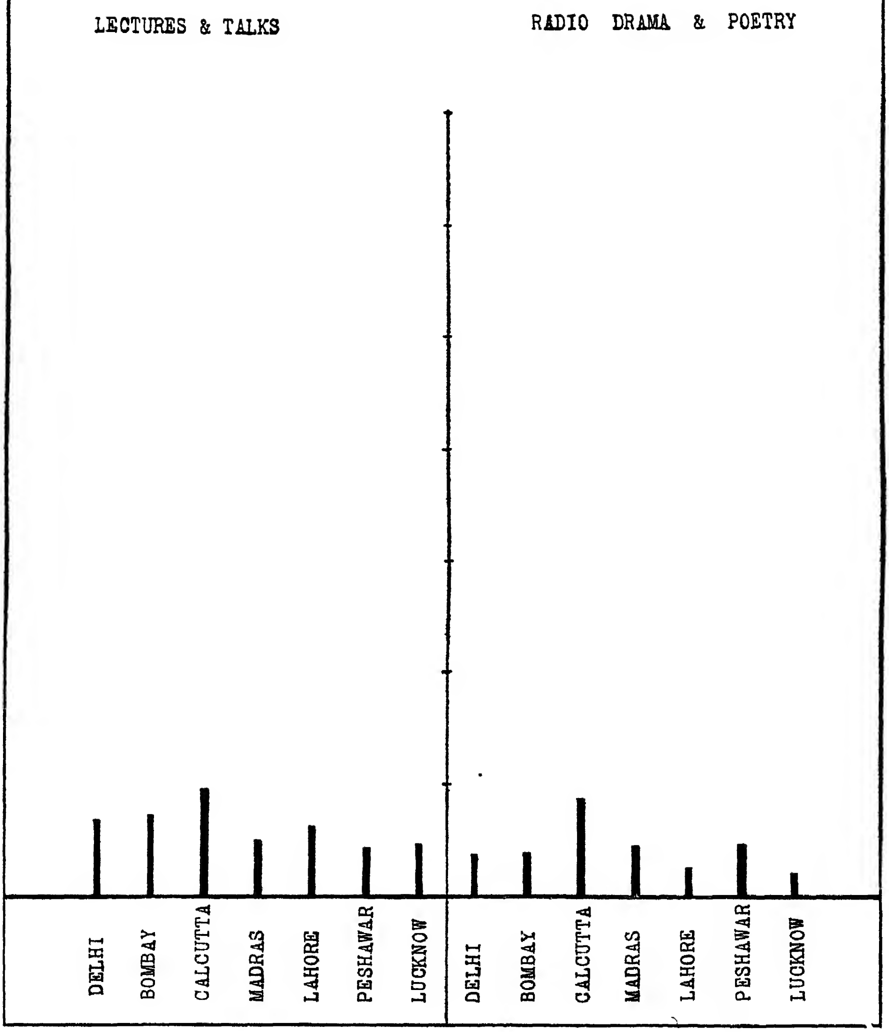


PROGRAMME COMPOSITION AT THE STATIONS

(In hours)

1938-39

1″ = 444 Hrs

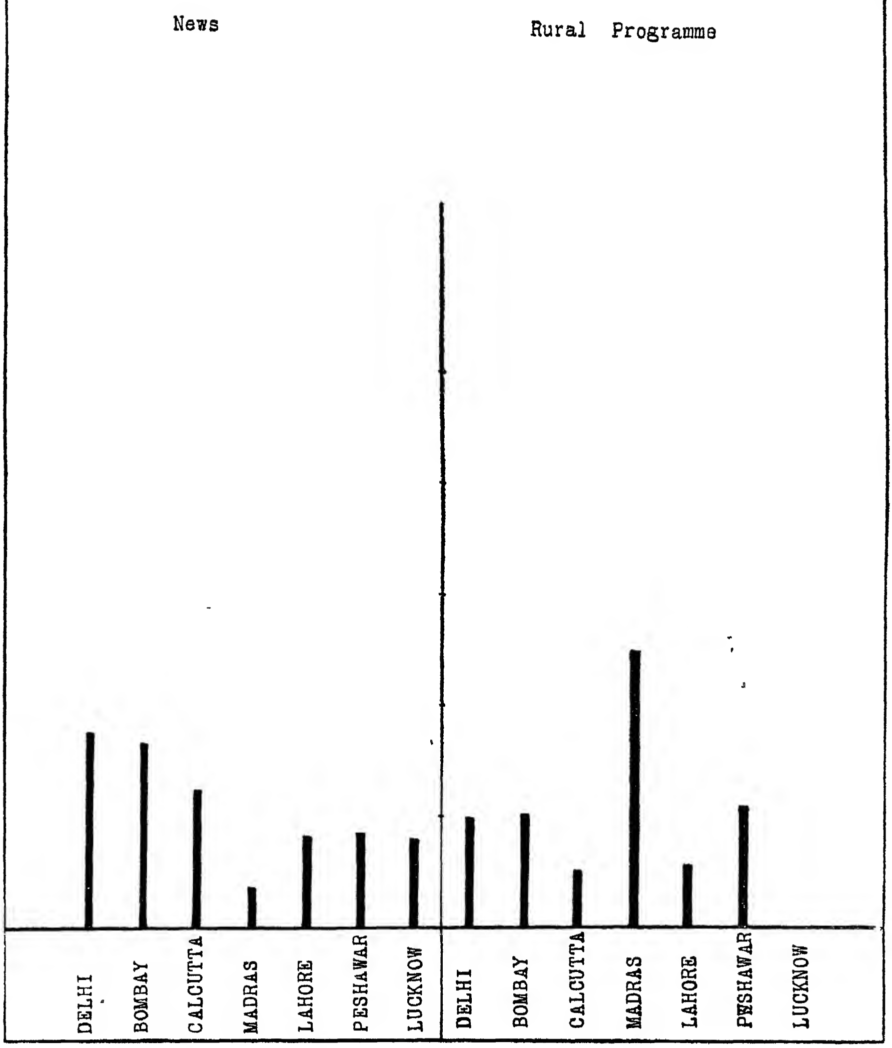


PROGRAMME COMPOSITION AT THE STATIONS

(In hours)

1938-39

1" = 444 Hrs.



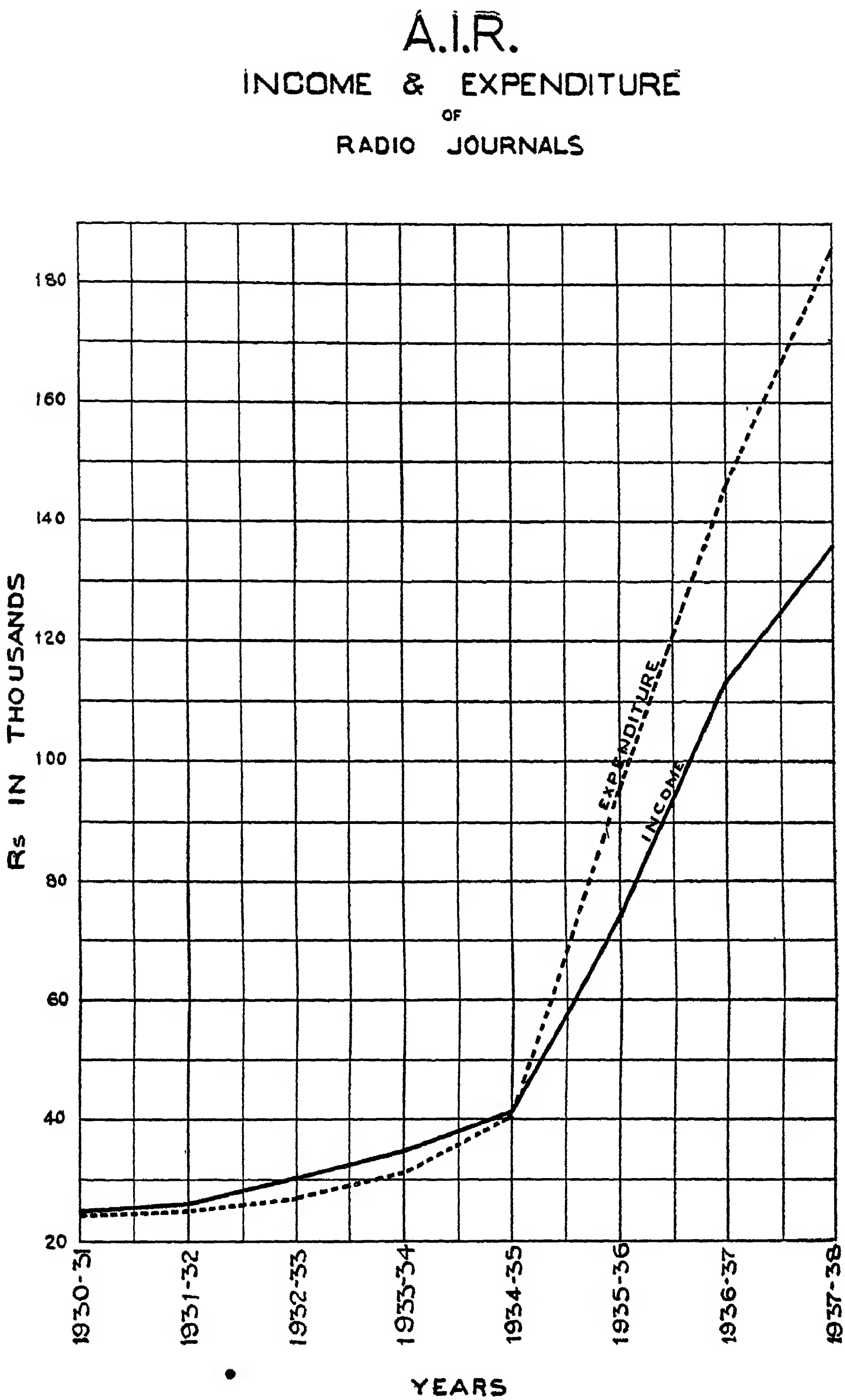
APPENDIX III.

PROFIT AND LOSS ACCOUNT OF THE RADIO JOURNALS OF A. I. R., 1930-31 TO 1938-39.

Year.	Indian Listener			Awaz			Sarang			Betar Jagat		
	Income	Expenditure	Loss or Gain —or+	Income.	Expenditure	Loss or Gain —or+	Income	Expenditure	Loss or Gain —or+	Income	Expenditure	Loss or Gain —or+
1	2	3	4	5	6	7	8	9	10	11	12	13
	Rs	Rs	Rs.	Rs.	Rs	Rs	Rs	Rs	Rs	Rs.	Rs	Rs.
1930-31	18,110	18,313	—203							6,848	6,105	+743
1931-32	18,645	18,235	+410	..		..				7,598	7,072	+526
1932-33	21,170	20,319	+851							9,252	7,065	+2,187
1933-34	26,023	24,105	+1,918							8,823	7,029	+1,794
1934-35	34,449	34,080	+369							7,061	6,662	+399
1935-36	64,811	80,359	—15,548	1,229	2,373	—1,144				8,009	8,543	—534
1936-37	99,559	1,12,517	—12,958	2,164	11,146	—8,982				11,525	11,299	+226
1937-38	1,05,627	1,39,116	—33,489	18,149	34,258	—16,109				11,856	12,248	—392
1938-39	1,08,876	2,00,173	—91,297	12,737	28,717	—15,980	4,988	11,580	—6,592	12,905	12,397	+508

PROFIT AND LOSS ACCOUNT OF THE RADIO JOURNALS OF A. I. R., 1930-31 TO 1938-39—*contd.*

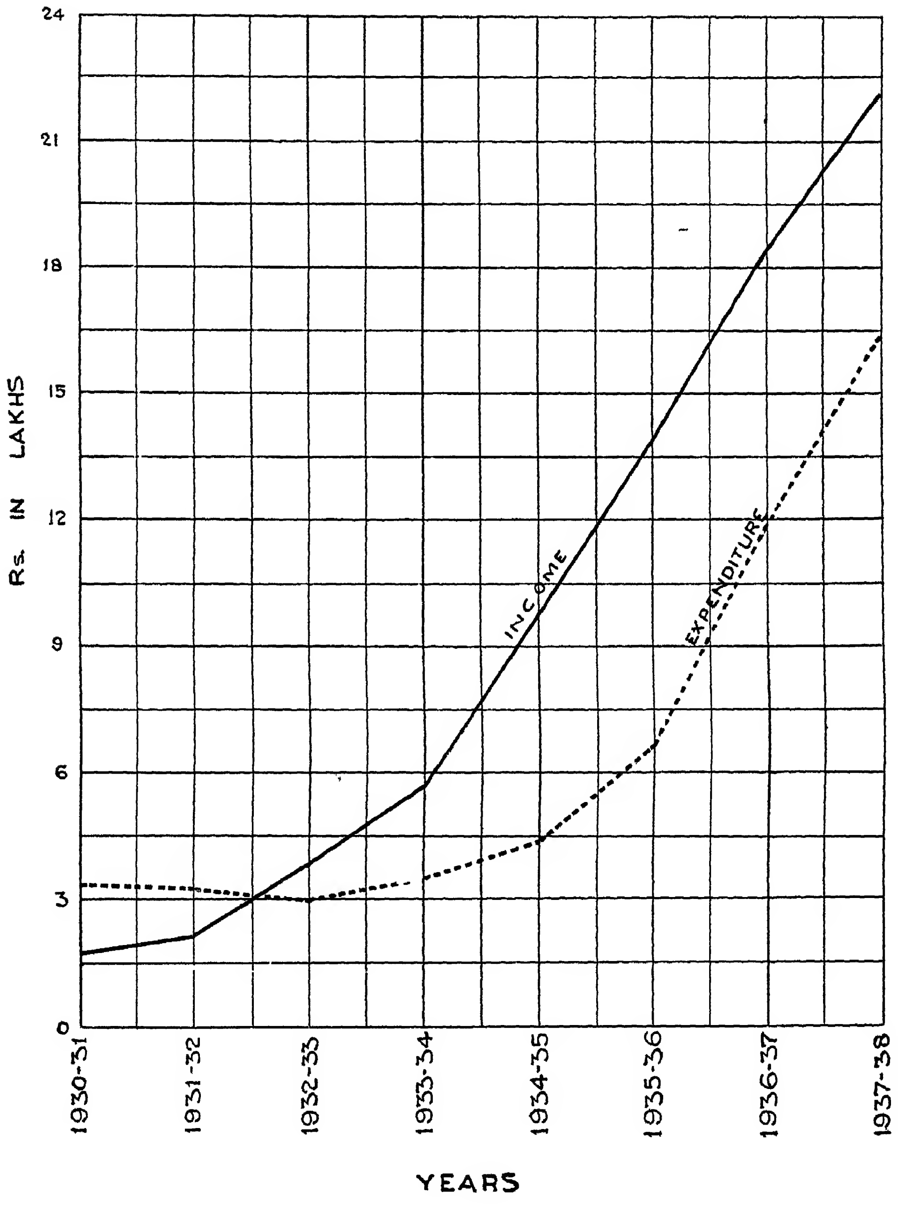
Year.	Vani			Vanoli.			Total Income.	Total Expenditure.	Total Loss or Gain —or+	Head-quarters Charges (Expenditure)	Grand Total of Loss or Gain —or+
	Income.	Expenditure	Loss or Gain —or+	Income.	Expenditure.	Loss or Gain —or+					
	14	15	16	17	18	19	20	21	22	23	24
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs	Rs	Rs.	Rs.	Rs.	Rs
1930-31	..	..	.	..	.		24,958	24,418	+540	.	+540
1931-32	.	.	..	..	..		26,243	25,307	+936	..	+936
1932-33	.	..		.	.		30,422	27,384	+3,038		+3,038
1933-34	.		..	..	..	.	34,846	31,134	+3,712	..	+3,712
1934-35	..	..	.	..	.	..	41,510	40,742	+768		+768
1935-36	..	..		.	.	.	74,049	91,275	—17,226	4,589	—21,815
1936-37	..	.	..		.		1,13,248	1,34,962	—21,714	11,416	—33,130
1937-38	..	.	..	..	..	.	1,35,632	1,85,622	—49,990	Apportioned among the various Journals.	— 49,990
1938-39	183	1,071	—888	3,616	5,048	—1,432	1,43,305	2,58 986	—1,15,681	Do	—1 15,681


A.I.R.
INCOME & EXPENDITURE
OF
RADIO JOURNALS
Rs IN THOUSANDS
180
160
140
120
100
80
60
40
20
EXPENDITURE
INCOME
1930-31
1931-32
1932-33
1933-34
1934-35
1935-36
1936-37
1937-38
YEARS

A.I.R.

TOTAL INCOME & EXPENDITURE

{INCLUDING RADIO PUBLICATIONS}



APPENDIX IV.

INCOME AND EXPENDITURE STATEMENT OF ALL INDIA RADIO FROM 1930-31 TO 1938-39.

Year.	No of Licences in force on 31st March.	Income.					Expenditure						Remarks
		Customs Revenue (gross)	Licence Revenue (gross)	Radio Publications	Miscellaneous Receipts.	Total Income.	Expenditure of the Service	Expenditure of Radio Publications	P & T Charges on Licences	Collection charges for Customs Revenue	Total Expenditure	—Loss or +Gain	
1	2	3	4	5	6	7	8	9	10	11	12	13	
		Rs	Rs	Rs	Rs.	Rs	Rs.	Rs.	Rs	Rs	Rs	Rs.	
1930-31 .	8,079	56,340	82,758	24,958	8,446	1,72,502	2,97,616	24,418	15,638		3,37,672	—1,65,170	
1931 32 ..	8,109	1,04,080	81,107	26,243	1,294	2,12,724	2,83,030	25,307	15,146	.	3,23,483	—1,10,759	
1932-33 .	9,275	2,55,041	95,396	30,422	4,872	3,85,731	2,59,338	27,384	10,610	.	2,97,332	+ 88,399	
1933-34 ..	12,037	4,07,998	1,22,875	34,846	4,357	5,70,076	3,00,994	31,134	12,778		3,44,906	+ 2,25,170	
1934-35 ..	17,881	7,48,234	1,88,609	41,510	2,743	9,81,096	3,80,833	40,742	18,219		4,39,794	+5,41,302	
1935-36	28,066	10,15,792	2,01,620	74,049	9,193	13,90,654	5,19,369	95,864	27,660	23,363*	6,66,256	+7,24,398	*2·3%
1936-37 ..	42,152	12,94,250	4,24,776	1,13,248	14,244	18,46,518	9,28,023	1,46,378	85,085	29,768	11,89,254	+6,57,264	
1937-38 ..	52,883	15,43,171	5,32,144	1,35,632	4,747	22,15,694	13,00,029	1,85,622	1,11,672	35,493	16,32,816	+ 5,82,878	
1938-39 ..	72,282	13,70,320	7,50,261	1,43,305	5,917	22,69,803	20,55,252	2,58,986	1,67,580	31,517	25,13,335	—2,43,532	
Total ..	..	67,95,226	25,69,546	6,24,213	55,813	1,00,44,798	63,24,484	8,35,835	4,64,388	1,20,141	77,44,848	+22 99 950	

APPENDIX V.

CAPITAL EXPENDITURE DURING 1935-36.

	Rs.
A. Works	76,198
B. Equipment	2,77,230
C. Establishment	16,125
D. Other Charges	23,734
	3,93,287

The expenditure under "Works" represented the cost of site for the Delhi 20 K.W.M.W. Transmitter at Kingsway, Delhi, and the construction of a building to house the Transmitter. It also included cost of foundations for masts and aerials of that Station.

The expenditure under "Equipment" was on account of apparatus and plant and masts and aerials for the Delhi Transmitter.

A payment of Rs. 16,125 was made to the Posts and Telegraphs Department for the temporary Wireless Works Division during 1935-36, which was created in September 1935 for the preparation of preliminary estimates, selection of sites, etc., for the new Broadcasting Stations of All India Radio, and for the supervision and erection of the Delhi Transmitter then in progress.

"Other charges" represented the expenditure on account of the purchase of furniture, fixtures, fittings and musical instruments for the Delhi Studios

CAPITAL EXPENDITURE DURING 1936-37.

During 1936-37, the actual expenditure incurred amounted to Rs. 1,39 423 the details of which are given below:—

	Rs.
A. Works	32,891
B. Equipment	80,246
C. Installation Department	26,286
	1,39,423

Under the head "Works" an expenditure of Rs. 30,000 was incurred on the purchase of the site for the proposed Broadcasting House in Parliament Street, New Delhi. The balance of Rs. 2,891 represented the cost of construction of a store godown and Chowkidar's quarters within the compound of the Transmitter of the Delhi Station.

The expenditure under "Equipment" was due to the purchase of the Peshawar Transmitter at a cost of Rs. 46,770 and equipments for the Research Department and the Receiving Centre, Todapur.

The expenditure under "Installation Department" represented payment to the Posts and Telegraphs Department of the actual cost of the Temporary Wireless Works Division during 1936-37 plus certain overhead charges.

CAPITAL EXPENDITURE DURING 1937-38.

The expenditure during 1937-38, amounted to Rs. 10,32,377 as detailed below :—

	Rs.
A. Works	1,97,930
B. Equipment (including the expenditure under the head "Charges in England") . ..	7,91,661
C Installation Department	42,786
	10,32,377

During this financial year, the sites for the Transmitters at Delhi, Lahore, Lucknow and Trichinopoly were purchased at a total cost of Rs. 8,075* the details of which are shown below. In the case of Madras the site was obtained from the Provincial Government free of cost. The construction of the Transmitter Buildings and of the Receiving Centre at Todapur was executed through the agency of the P. W. Ds.—Central or Provincial—and a total expenditure of Rs. 1,78,215† as detailed below was incurred during the year on this account. An expenditure of Rs. 11,640 was also incurred this year departmentally on alterations to the Studios at Lahore, Lucknow and Madras.

The expenditure under "Equipment" was on account of the purchase of apparatus and plant, masts and aerials, power supply equipments, obstruction lights, cables, studio equipments, etc It also included cost of furniture, musical instruments and motor cars for the various stations and of acoustic treatment of studios. The purchase of all these equipments and stores was arranged through the I. S. D.

In January 1937, an Installation Department under All India Radio, was created on a temporary basis to replace the Wireless Works Division of the Posts and Telegraphs Department for the purpose of carrying out the Installation work of the proposed Broadcasting Stations.

CAPITAL EXPENDITURE DURING 1938-39.

The Capital expenditure during 1938-39 amounts to Rs. 8,22,977 as detailed below :—

	Rs.
A. Works	1,71,540
B. Equipment	5,95,516
C. Installation Department	55,921
	8,22,977

	Rs.
*Delhi	2,821
Trichinopoly	2,891
Bombay (cost of preliminary arrangement for the acquisition of the site)	158
Lucknow	500
Lahore	1,705
	8,075

	Rs.
†Delhi	29,267
Madras	31,083
Trichinopoly	6,613
Bombay	36,006
Calcutta	21,881
Dacca	1,012
Lucknow..	22,564
Lahore	20,347
Receiving Centre, Todapur ..	9,442
	1,78,215

APITAL GRANT.

Statement of expenditure.

Total allotment : Rs. 40 lakhs)

Head of expenditure.	1935-36.	1936-37.	1937-38.	1938-39.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs.
1. A. Works	76,198	32,891	1,97,930	1,71,540	4,78,559
2. B. Equipment	2,77,230	80,246	7,91,661	5,95,516	17,44,653
3. C. Establishment*	16,125	26,286	42,786	55,921	1,41,118
4. D. Other charges	23,734	.	..	.	23,734
Total ..	3,93,287	1,39,423	10,32,377	8,22,977	23,88,067†

		Rs.
Grand total of expenditure till 31st March 1939	..	23,88,067
Balance left over on the 1st April 1939	.. ..	16,11,933

* The expenditure has been adjusted under the head " C.—Installation Department " with effect from the financial year 1936-37 onwards.

† There is a difference of Rs. 3, but the figure given has been accepted.

APPENDIX VI.

A STATEMENT SHOWING THE PROGRESS OF WORKS ON THE 31ST MARCH 1939.

(a) Works completed on or before the 31st March 1939.

1. Delhi Mediumwave Station.
2. Peshawar Mediumwave Station.

(b) Works in progress on the 31st March 1939.

1. Research Equipment
2. Receiving Centre, Todapur.
3. Delhi Shortwave Stations—Nos. 1 and 2
4. Supply of spares.
5. Madras Medium and Short Wave Stations.
6. Trichinopoly Mediumwave Station.
7. Bombay Shortwave Station.
8. Modifications to the Bombay Mediumwave Station
9. Bombay Studios.
10. Air-conditioning of Bombay Studios.
11. Site for Bombay Transmitter.
12. Calcutta Shortwave Station.
13. Modifications to the Calcutta Mediumwave Station.
14. Dacca Mediumwave Station
15. Dacca High Tension Underground Cables.
16. Lucknow Mediumwave Station
17. Lucknow High Tension Underground Cables.
18. Lahore Mediumwave Station
19. Receiving Centre, Bombay.
20. Receiving Centre, Peshawar.

(c) Works not started on the 31st March 1939.

1. Broadcasting House, New Delhi. (Site acquired but construction work postponed indefinitely).
2. Receiving Centre, Madras.
3. Trichinopoly Receiving Centre.
4. Receiving Centre, Calcutta.
5. Calcutta Studios
6. Receiving Centre, Dacca.
7. Receiving Centre, Lucknow
8. Receiving Centre, Lahore

APPENDIX VII.

DESIGNATION OF OFFICERS AND STAFF AND SCALES OF PAY.

Designation.	Scale of Pay.	Remarks.
(a) All India Radio Headquarters.		
	Rs.	
Controller of Broadcasting	2,000—50—2,200.	
Deputy Controller of Broadcasting	1,000—50—1,250.	
Administrative Officer*	500—25—750.	* The present incumbent gets a personal pay of Rs. 1,000.
Chief Engineer	1,650—50—1,850.	
Assistant Chief Engineer	750—25—900.	
(b) Stations.		
(i) Programme Staff.		
Station Directors	750—25—900	Delhi, Calcutta and Bombay.
	500—25—750	Other Stations.
Assistant Station Directors	350—20—450—25/2—500.	
Directors of Programmes	250—10—350.	
Programme Assistants	150—10—250.	
Announcers	150—10—250 and 150	European.
	100—5/2—150	Indian.
(ii) Technical Staff.		
Station Engineers	300—20—600	Delhi, Bombay and Calcutta.
	250—15—400	Other Stations.
Assistant Engineers	200—10—300.	
Technical Assistants	100—10—150	Old Scale.
	100—5/2—150	New Scale.
Mechanics	30—3—84—4—100.	
(iii) Clerical Staff, etc.		
Accountants	130—6—190	Calcutta.
	100—5—150	Madras, Lahore, Peshawar, Lucknow.
Divisional Accountants	200—20—300	Installation Department.
	100—10—270—30/5—300.	Bombay and Delhi.
Head Clerk	100—5—150	Research and Installation Departments.
Clerks, Grade I	100—4—120	Bombay and Calcutta.
	95—4—115	Others.
Clerks, Grade II	45—45—3—90	Bombay and Calcutta.
	40—40—3—85	Others except Trichinopoly.
	35—35—3—80	Trichinopoly.

DESIGNATION OF OFFICERS AND STAFF AND SCALES OF PAY—*contd.*

Designation.	Scale of pay.	Remarks
	(b) Stations—*contd.*	
	***(iii) Clerical Staff, etc.*—contd.**	
	Rs.	
Clerks other than Grades I and II ..	40—2—60 30—1—40 ..	Research Department.
Stenographers	125—5—180—10—300.	News Organisation.
	75—5—125 ..	Indian Listener and Installation Department.
	50—5—145 ..	Delhi.
	50—5—150 .	Bombay and Calcutta.
Telephone Attendants . ..	45—45—3—90 ..	Bombay and Calcutta.
	40—40—3—85 ..	Others.
Motor Drivers	40—2—60 ..	Bombay, Delhi and Calcutta.
	40 ..	Others.
Cleaner Drivers	30	
	(c) Other Subordinate Offices	
Research Engineer	300—20—600.	
Installation Engineer	600.	
Deputy Installation Engineer ..	300—20—600.	
News Editor	1,000—50—1.500*.	*The present incumbent gets a special Overseas pay of £30
Sub-Editor (News)	300—20—500.	
Assistant Editor (News)	150—10—300.	
Translators	150—5—200 .	News Organisation.
	60—3—90 ..	Indian Listener.
Editor, Indian Listener	500—25—750	
Sub-Editors of Radio Journals ..	150—10—300.	

APPENDIX VIII.

DISTRIBUTION LIST OF STRENGTH OF SANCTIONED STAFF AT STATIONS AND SUBORDINATE OFFICES OF ALL INDIA RADIO.

As on 31st March 1939.

Staff.	Delhi.	Bombay.	Cal-cutta.	Madras.	Lahore.	Pesha-war	Luck-now	Trichi-nopoly	Research Depart-ment.	Instal-lation Depart-ment.	News Editor.	Editor, Indian Listener	Total.	Remarks.
Programme Staff.														
Station Director	1	1	1	1	1	..	1	1	..	..	..	..	7	
Assistant Station Director ..	1	1	1	..	..	..	..	..	..	..	..	..	3	
Director of Programmes ..	1	1	1	1	1	.	1	1	..	..	..	.	7	
Programme Assistants ..	6	5	5	4	4	1*	4	4	..	..	..	..	33	*Officer-in-charge
Announcer—Indian ..	3	1	1	1	1	1	1	1	..	..	..	..	10	
Announcer—European ..	1	1	1	.	..	..	..	..	..	..	..	..	3	
Technical Staff.														
Station Engineer	1	1	1	1	1	..	1	1	..	..	.	..	7	
Assistant Engineers ..	5	3	3	1	1	1	1	1	1	3		..	20	
Technical Assistants ..	11	10	9	3+1*	3	3	3	3	4	3	.	..	52+1*	*Sanctioned under C. B's powers.
Mechanics	4	4	3	2	2	2	2	2	2	6	..	..	29	
Draughtsman	..	..	..	..	..	..	..	..	..	1	..	..	1	

Clerical Staff.													
Accountant	..	..	1	1	1	1	1	1	..	..	..	..	6
Divisional Accountant ..	1	1	..	..	..	..	..	..	..	1	..	..	3
Head Clerk	..	..	..	..	..	..	..	..	1	1	..	..	2
Clerks, Grade I	2	1	1	..	..	..	..	..	..	..	..	1	5
Clerks, Grade II	5	4	5	3	3	..	3	3	1	3	1	8	39
Clerks, other than Grades I and II.	..	..	..	..	..	..	..	..	2	..	..	..	2
Stenographer	1	1	1	..	..	..	..	..	..	1	2	1	7
Telephone Attendant ..	2	2	2	1	1	..	1	..	..	..	..	..	9
Motor Driver	3	2	2	1	1	..	1	1	2	..	..	..	13
Cleaner Drivers	..	1	1	1	1	..	1	..	..	..	..	..	5
Other Officers.													
Research Engineer ..	..	..	..	..	.	..	..	..	1	..	..	..	1
Installation Engineer ..	..	..	..	..	..	..	..	..	..	1	..	..	1
Deputy Installation Engineers	..	..	..	..	..	..	..	..	..	2	..	..	2
News Editor	..	..	..	..	..	..	..	.	..	..	1	..	1
Sub-Editor, News	..	..	..	..	..	..	.	..	.	..	1	..	1
Assistant Editor, News ..	..	..	..	..	..	..	..	..	..	..	1	..	1
Translators	..	..	..	..	..	..	..	..	..	.	7	1	8
Editor, Indian Listener ..	..	..	..	..	..	..	.	.	..	.	..	1	1
Sub-Editors, Radio Journals..	..	..	1	1	..	..	..	..	..	..	..	2	4

APPENDIX IX.

COMMUNAL COMPOSITION OF STAFF IN EMPLOYMENT IN ALL INDIA RADIO ON 31st MARCH 1939

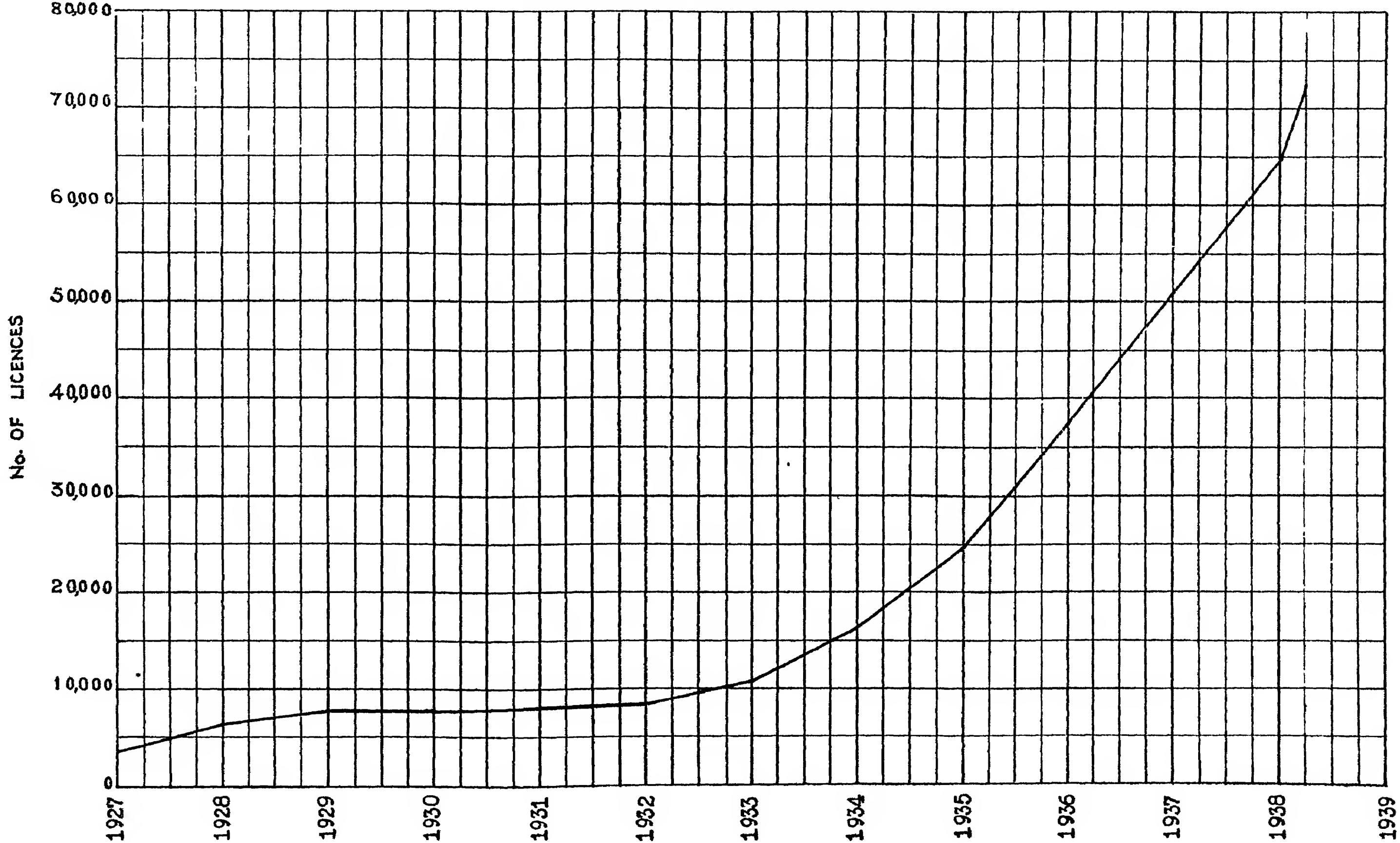
I.—*Posts exempted from the application of Government orders regarding communal representation*

Name of post	Hindus.	Muslims	European and Anglo-Indians	Sikhs.	Indian Christians	Parsis.
Headquarters (Officers)	1	1	2	.		..
News Editor	.	.	1	.		..
Station Directors .. .	2	2	1	.	2	..
Assistant Station Directors .	2	1	..	..		..
Station Engineers .	5	.	.	.	.	1
Directors of Programmes ..	6	1	..			..
Research Engineer .	.		.			..
Installation Engineer . .	1	..	.	.	..	..
Deputy Installation Engineers ..	2	.		.		..
Editor, Indian Listener	.		.		1	.
TOTAL	19	5	4		3	1

II.—*Post not exempted from the application of Government orders regarding communal representation.*

Name of post	Hindus.	Muslims	European and Anglo-Indians	Sikhs.	Indian Christians	Parsis.
Programme Assistants	21	10	..	.	.	1
Assistant Engineers . ..	13	1	1		..	..
Technical Assistants . .	36	7		.	3	1
Technical Probationers .	2	1	..	..	.	..
Sub-Editors of Radio Journals	2	2	..	.	..	.
Sub and Assistant Editor (News Organization)	2		..	..	..	..
Announcers (Indian and European).	2	5	2	.	1	..
Translators	4	2	..	..	.	..
Clerical Staff (Headquarters)	28	16	1	1	3	..
Clerical Staff (excluding Headquarters)	36	19	1	3	1	2
Mechanics . .	13	4	..	3	1	1
Telephone Attendants	2	3	2	..	.	1
Motor Drivers and Cleaner Drivers	7	8	..	..	2	..
TOTAL ..	168	78	7	7	11	6
GRAND TOTAL ..	187	83	11	7	14	7

B.R. LICENCES IN FORCE IN INDIA



APPENDIX X.

TABLE OF B. R. AND OTHER KINDS OF LICENCES ISSUED, ETC

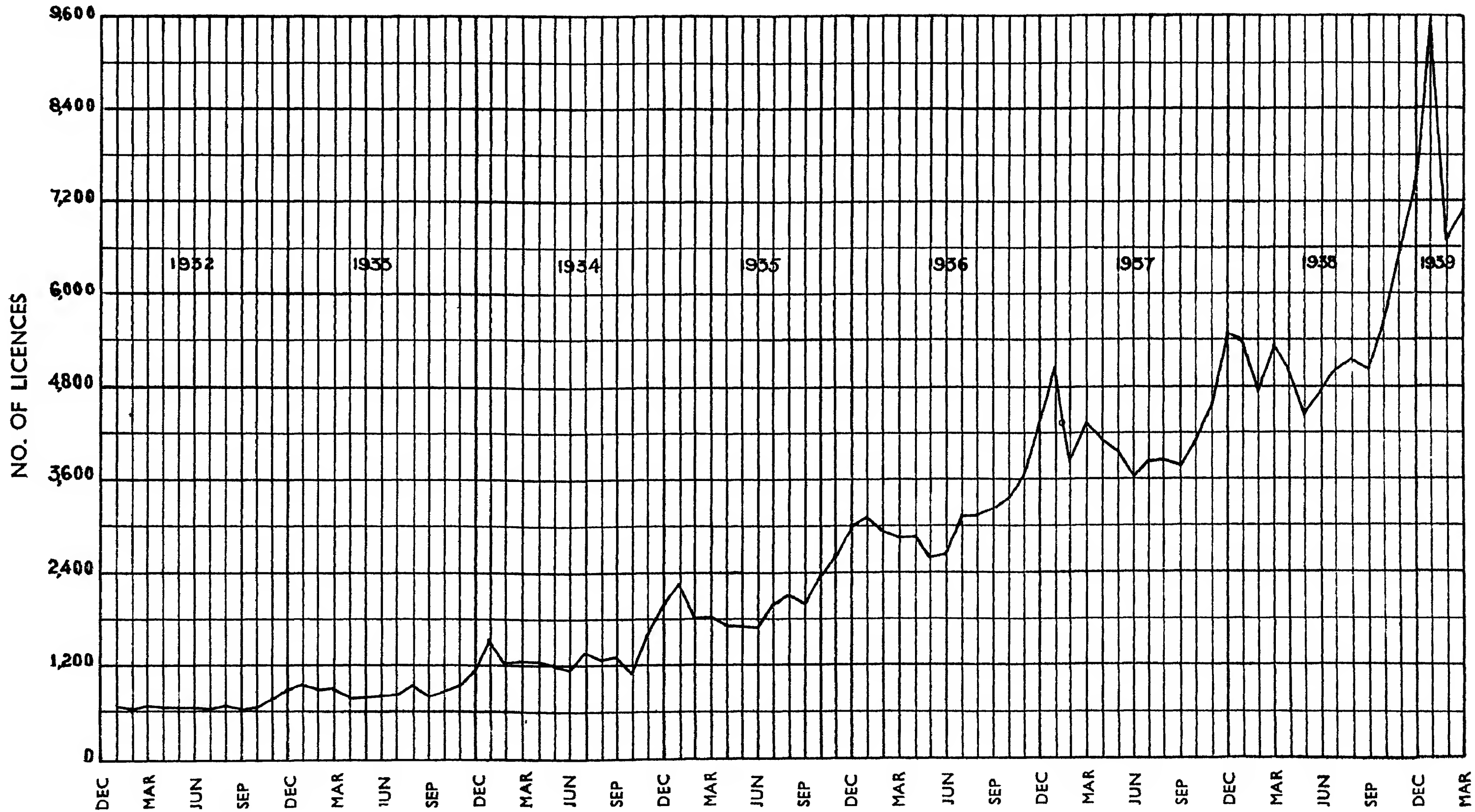
(1) B. R. Licences.

	Year.	Total issued	New Licences.	Licences Renewed.	Licences Lapsed	Total Licences in force
	1927		.	..	..	3,594
	1928		..	.	..	6,152
	1929		.	.	.	7,775
	1930		.	..	..	7,719
	1931			..	..	8,056
January ..	1932	751	.	..	..	..
February ..	1932	659	..	..	..	..
March	1932	732		.	..	..
April ..	1932	694		..	.	..
May ..	1932	660		..	..	..
June . ..	1932	669	.	..	..	..
July	1932	649		..	.	..
August ..	1932	749		..	..	..
September .	1932	612	..	..	..	..
October ..	1932	680		.	..	..
November ..	1932	770	.	..	..	..
8557 December ..	1932	932	..	..	..	8,557
January ..	1933	992	..	..	..	8,798
February ..	1933	916	..	.	..	9 055
March .. .	1933	952	.	..	..	9,275
April .. .	1933	794	.	..	..	9,375
May .. .	1933	798	.	.	..	9,513
June	1933	829	.		..	9,673
July	1933	835	..	.		9,859
August ..	1933	943		.	.	10,053
September ..	1933	834		..	..	10,275
October ..	1933	873	..	..	.	10,468
November ..	1933	982	.	..	..	10,680
10872 December ..	1933	1,124	.	..	..	10,872

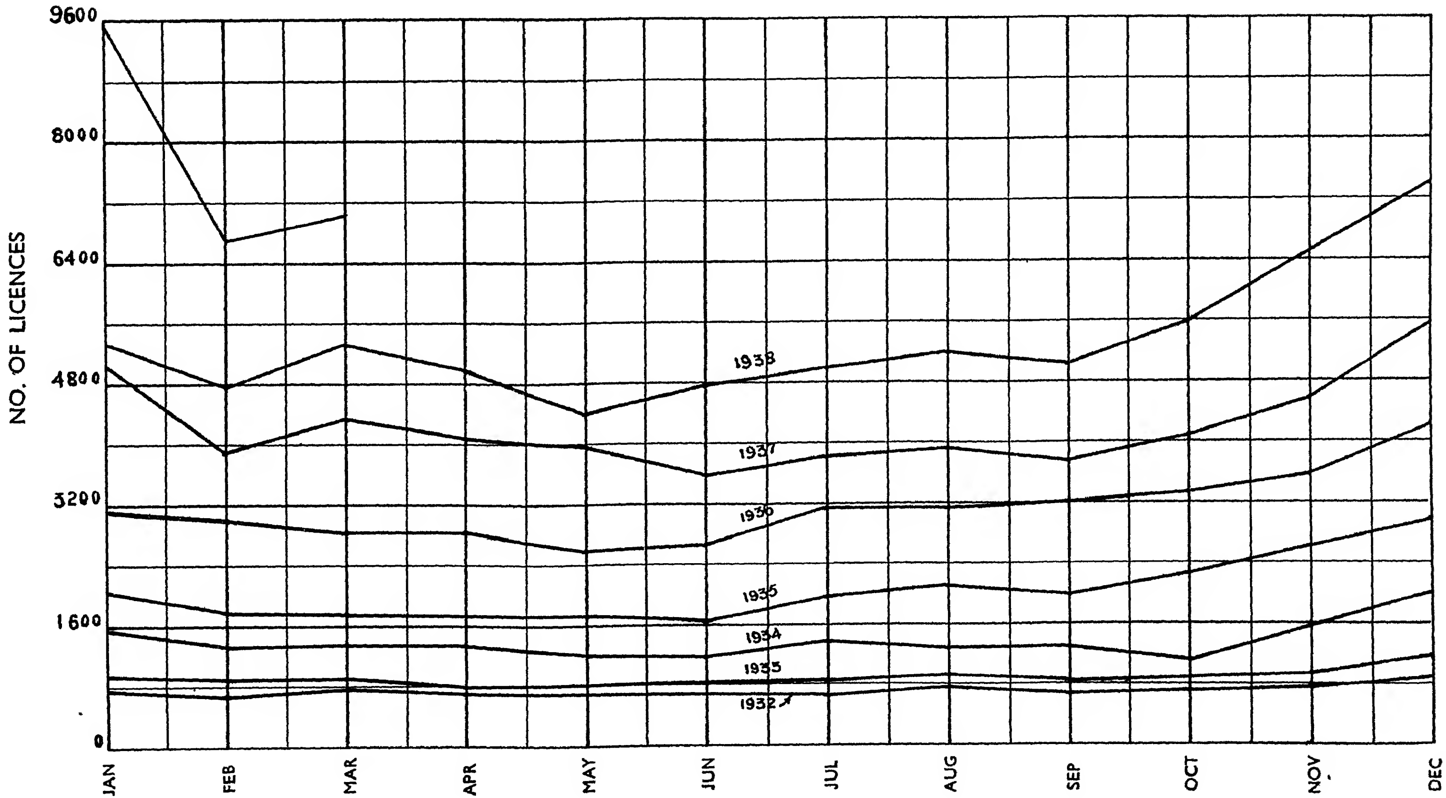
TABLE OF B. R. AND OTHER KINDS OF LICENCES ISSUED, ETC.—*contd.*

	Year.	Total issued.	New Licences.	Licences Renewed.	Licences Lapsed.	Total Licences in force.
January ..	1934	1,529	.	..	..	11,409
February ..	1934	1,230	..	..	..	11,723
March	1934	1,266	..	..	..	12,037
April	1934	1,251	..	..	..	12,494
May	1934	1,201	..	..	..	12,897
June	1934	1,140	..	..	..	13,208
July	1934	1,363	..	..	..	13,736
August ..	1934	1,285	..	..	..	14,078
September ..	1934	1,301	..	..	..	14,545
October ..	1934	1,099	..	..	..	14,771
November ..	1934	1,576	..	..	..	15,365
16179 December ..	1934	1,938	..	..	..	16,179
January ..	1935	2,080	..	..	..	16,730
February ..	1935	1,815	..	..	..	17,315
March	1935	1,832	..	..	..	17,881
April	1935	1,764	..	..	..	18,394
May	1935	1,727	..	..	..	18,920
June	1935	1,675	..	..	..	19,455
July	1935	1,992	..	..	..	20,084
August ..	1935	2,098	..	..	..	20,897
September ..	1935	1,969	..	..	..	21,565
October ..	1935	2,287	..	..	..	22,753
November ..	1935	2,606	1,392	1,214	362	23,783
24839 December ..	1935	2,994	1,540	1,454	484	24,839
January ..	1936	3,131	1,649	1,482	598	25,890
February ..	1936	2,967	1,567	1,400	415	27,042
March ..	1936	2,856	1,562	1,294	538	28,066
April	1936	2,878	1,594	1,284	480	29,180
May	1936	2,580	1,520	1,060	667	30,033
June	1936	2,623	1,329	1,294	381	30,981
July	1936	3,139	1,562	1,577	415	32,128
August ..	1936	3,128	1,589	1,539	559	33,158

MONTHLY ISSUES OF B.R. LICENCES (i)



MONTHLY ISSUES OF B.R. LICENCES (II)



LICENCE FIGURES

(III)

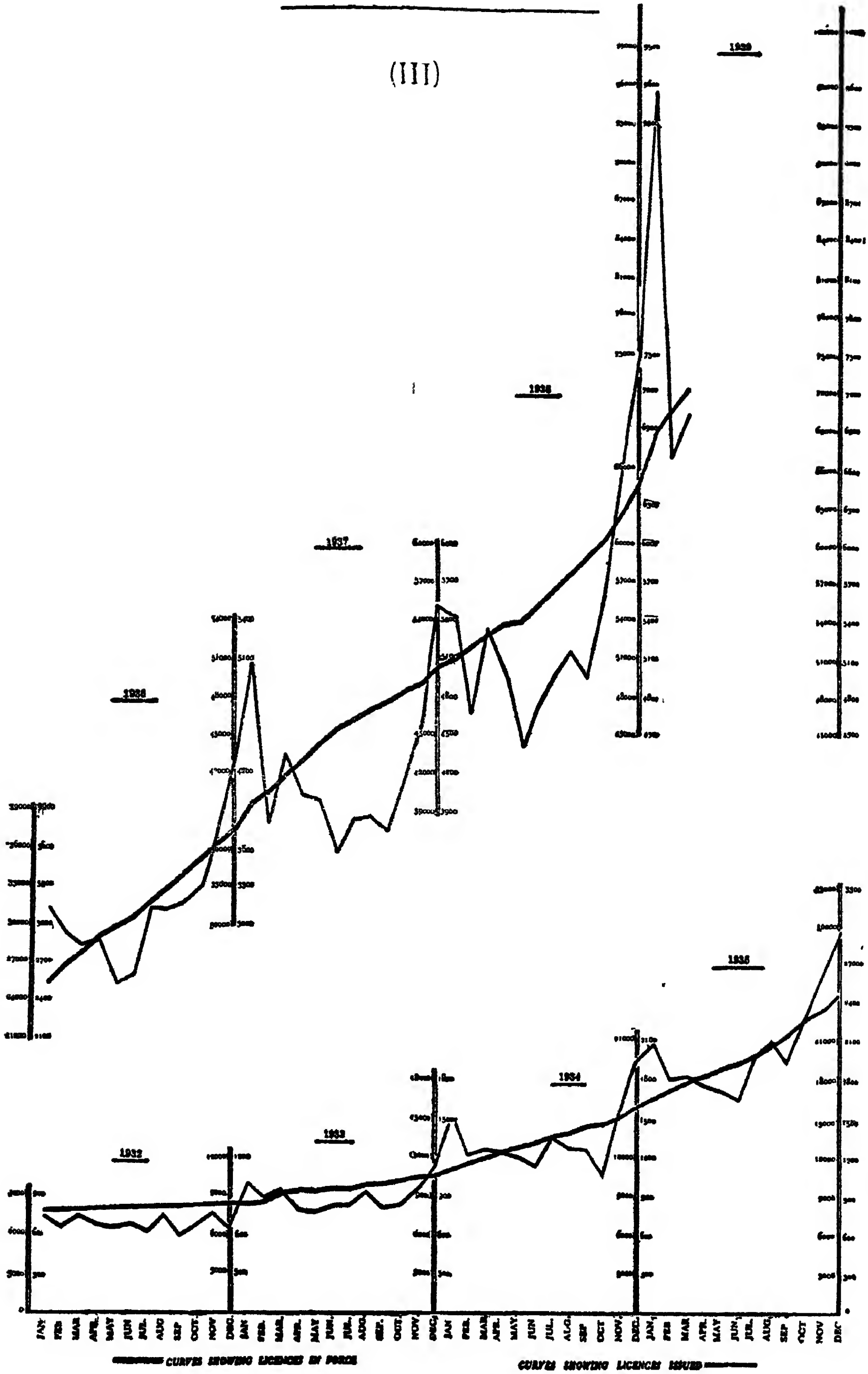


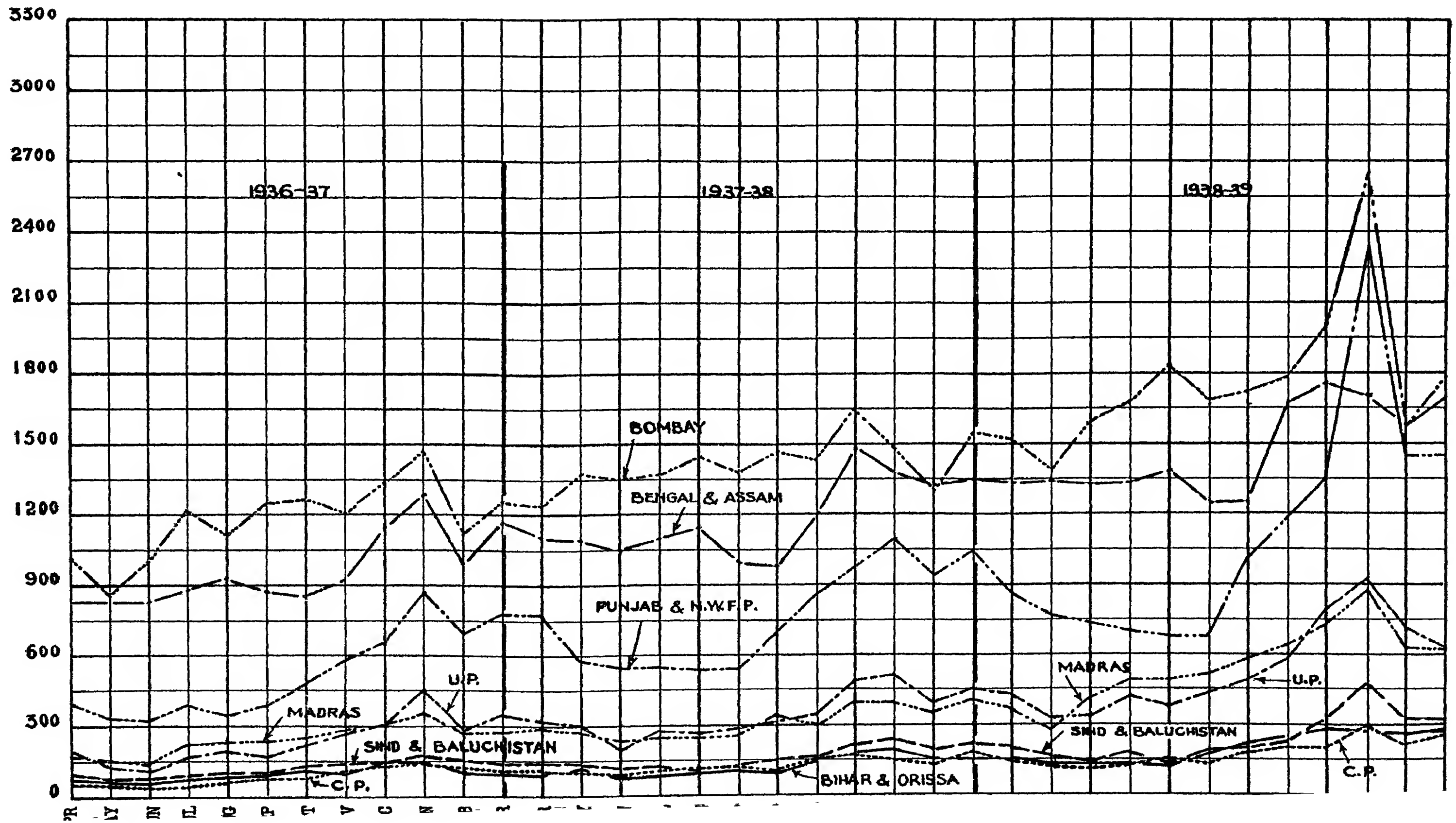
TABLE OF B. R. AND OTHER KINDS OF LICENCES ISSUED, ETC.—*concld.*

	Year.	Total issued.	New Licences.	Licences Renewed.	Licences Lapsed.	Total Licences in force.
September .	1936	3,194	1,620	1,574	395	34,383
October .	1936	3,353	1,511	1,842	447	35,449
November .	1936	3,691	1,801	1,890	716	36,534
37797 December .	1936	4,257	2,044	2,213	781	37,797
January .	1937	5,071	2,433	2,638	493	39,737
February ..	1937	3,882	1,912	1,970	997	40,652
March .	1937	4,356	2,073	2,283	573	42,152
April	1937	4,077	2,174	1,903	975	43,351
May	1937	3,980	2,288	1,692	888	44,751
June ..	1937	3,622	1,557	2,065	558	45,750
July	1937	3,843	1,586	2,257	882	46,454
August ..	1937	3,874	1,665	2,209	919	47,200
September ..	1937	3,765	1,485	2,280	914	47,771
October ..	1937	4,106	1,622	2,484	869	48,524
November ..	1937	4,592	1,899	2,693	998	49,425
50680 December ..	1937	5,512	2,166	3,346	911	50,680
January .	1938	5,405	2,367	3,038	2,033	51 014
February ..	1938	4,754	2,247	2,507	1,375	51,886
March	1938	5,353	2,212	3,141	1,215	52,883
April	1938	5,004	2,100	2,904	1,173	53,810
May	1938	4,458	1,976	2,482	1,498	54,288
June	1938	4,753	2,030	2,723	899	55,419
July	1938	4,995	2,161	2,834	1,009	56,571
August ..	1938	5,167	2,319	2,848	1,026	57,864
September ..	1938	5,046	2,275	2,771	994	59,145
October ..	1938	5,595	2,352	3,243	863	60,634
November ..	1938	6,502	2,922	3,580	1,012	62,544
64480 December ..	1938	7,448	3,161	4,287	1,225	64,480
January ..	1939	9,570	5,464	4,106	1,299	68,645
February ..	1939	6,709	3,151	3,558	1,196	70,600
March	1939	7,035	3,008	4,027	1,326	72,282

SUMMARY OF BROADCAST RECEIVER LICENCES ISSUED DURING 1936 ACCORDING TO POSTAL CIRCLES.

Postal Circle.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1. Bombay	1,004	1,012	874	991	1,218	1,115	1,243	1,260	1,203	1,336
2. Bengal and Assam ..	799	831	846	842	887	937	866	824	932	1,145
3. United Provinces ..	162	191	137	108	159	183	156	191	266	299
4. Central	70	55	52	31	49	60	79	77	110	121
5. Madras	230	179	146	143	213	230	225	238	271	296
6. Punjab and North West Frontier Province.	382	387	328	311	392	349	387	462	581	659
7. Bihar and Orissa ..	46	58	57	54	65	76	78	95	92	141
8. Sind and Baluchistan	93	96	63	68	78	86	85	122	132	140
9. Burma .. .	70	69	77	75	78	92	75	84	104	120
Total ..	2,856	2,878	2,580	2,623	3,139	3,128	3,194	3,353	3,691	4,257

MONTHLY ISSUES OF B.R. LICENCES IN POSTAL CIRCLES



SUMMARY OF BROADCAST RECEIVER LICENCES ISSUED DURING 1937 ACCORDING TO POSTAL CIRCLES.

Postal Circle.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1. Bombay	1,488	1,120	1,264	1,249	1,372	1,348	1,382	1,435	1,370	1,453	1,428	1,655
2. Bengal and Assam	1,290	983	1,161	1,111	1,107	1,045	1,112	1,140	998	972	1,197	1,487
3. United Provinces	452	292	334	306	301	208	285	254	275	309	359	484
4. Central	128	114	104	105	99	75	81	100	117	86	147	162
5. Madras	357	282	281	295	276	217	247	240	253	339	301	383
6 Punjab and North West Frontier Province.	865	669	781	767	575	529	532	515	516	693	852	964
7. Bihar and Orissa	156	109	105	97	110	97	95	95	112	104	155	165
8. Sind and Baluchistan	168	151	143	147	140	103	109	95	124	150	153	212
9. Burma*	167	162	183	..	..		..	..	..	..	..	..
Total ..	5,071	3,882	4,356	4,077	3,980	3,622	3,843	3,874	3,765	4,106	4,592	5,512

* With effect from the 1st April 1937, Burma ceased to be part of India.

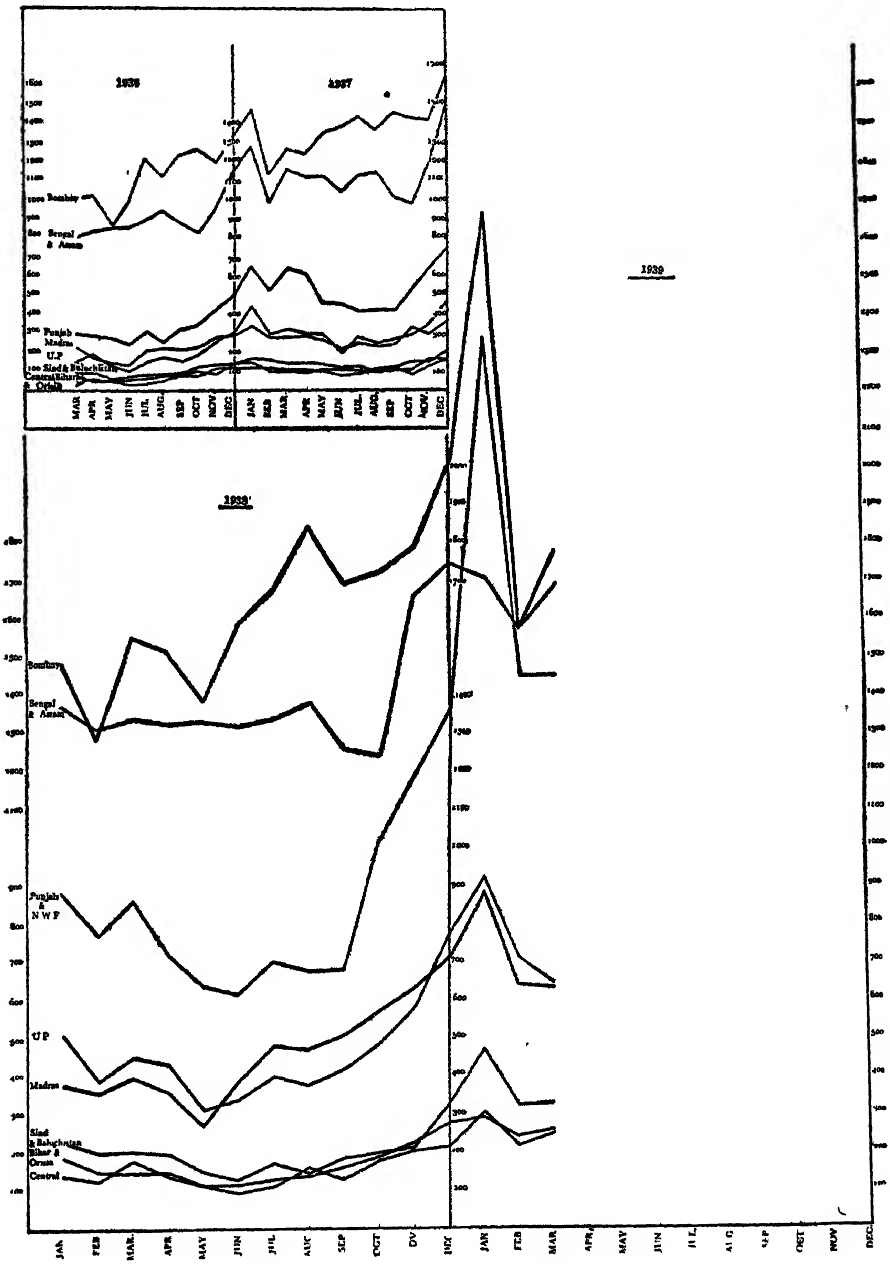
SUMMARY OF BROADCAST RECEIVER LICENCES ISSUED DURING 1938 ACCORDING TO POSTAL CIRCLES.

Postal Circle.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November	December.
1. Bombay	1,482	1,289	1,553	1,510	1,387	1,594	1,680	1,840	1,696	1,727	1,795	2,016
2. Bengal and Assam .. .	1,371	1,304	1,345	1,325	1,334	1,323	1,334	1,378	1,257	1,243	1,660	1,742
3. United Provinces	512	393	454	432	315	344	405	377	415	477	587	787
4. Central	146	127	187	144	111	98	111	152	140	179	205	216
5. Madras	380	358	399	369	272	394	474	465	508	572	627	717
6. Punjab and North West Frontier Province.	1,089	933	1,055	869	768	742	698	675	673	1,013	1,189	1,356
7. Bihar and Orissa	191	151	151	150	116	122	125	138	167	188	222	281
8. Sind and Baluchistan	234	199	209	205	155	136	168	142	190	196	217	333
Total ..	5,405	4,754	5,353	5,004	4,458	4,753	4,995	5,167	5,046	5,595	6,502	7,448

CURVES SHOWING LICENCES ISSUED

ACCORDING TO POSTAL CIRCLES

(II)



SUMMARY OF BROADCAST RECEIVER LICENCES ISSUED DURING 1939 ACCORDING TO POSTAL CIRCLES.

Postal Circle.	January.	February.	March.
1. Bombay	2,657	1,564	1,779
2. Bengal and Assam	1,709	1,565	1,699
3. United Provinces	922	710	636
4. Central	300	218	252
5. Madras	883	633	624
6. Punjab and North West Frontier Province	2,339	1,450	1,452
7. Bihar and Orissa	289	244	262
8. Sind and Baluchistan	471	325	331
Total ..	9,570	6,709	7,035

TOTAL BROADCAST RECEIVER LICENCES ISSUED MONTH BY MONTH.

	1932.	1933.	1934.	1935.	1936.	1937.	1938.	1939.
January	751	992	1,529	2,080	3,131	5,071	5,405	9,570
February	659	916	1,230	1,815	2,967	3,882	4,754	6,709
March	732	952	1,266	1,832	2,856	4,356	5,353	7,035
April	694	794	1,251	1,764	2,878	4,077	5,004	
May	660	798	1,201	1,727	2,580	3,980	4,458	
June	669	829	1,140	1,675	2,623	3,622	4,753	
July	649	835	1,363	1,992	3,139	3,843	4,995	
August	749	943	1,285	2,098	3,128	3,874	5,167	
September	612	834	1,301	1,969	3,194	3,765	5,046	
October	680	873	1,099	2,287	3,353	4,106	5,595	
November	770	982	1,576	2,606	3,691	4,592	6,502	
December	932	1,124	1,938	2,994	4,257	5,512	7,448	
Total ..	8.557	10,872	16,179	24,839	37,797	50,680	64.480	

(ii) STATEMENT SHOWING NUMBER OF DEMONSTRATION, POSSESSION (DEALERS AND NON-DEALERS) AND COMMERCIAL BROADCAST RECEIVER LICENCES, ISSUED AND IN FORCE.

Month.	Demonstration.		Possession. (Dealers and Non-dealers)		Commercial Broadcast Receiver.	
	Issued.	In force.	Issued.	In force.	Issued	In force
January 1938 ..	106	..	201	..	224	..
February ,, ..	93	..	124	.	212	..
March , ..	80	..	155	..	193	..
April ,, ..	61	..	125	..	168	..
May ,, ..	69	..	135	..	212	..
June ,, ..	151	..	134	..	162	..
July ,, ..	153	..	151	..	268	..
August ,, ..	152	.	155	..	228	..
September ,, ..	90	..	117	..	237	..
October ,, ..	108	.	147	..	195	..
November ,, .	181	.	152	.	268	..
December ,, ..	157	1,401	180	1,776	211	2,578
January 1939 ..	214	1,509	221	1,796	435	2,789
February ,, ..	170	1,586	186	1,858	376	2,953
March ,, ..	159	1,665	171	1,874	314	3,074

STATEMENT SHOWING NUMBER OF DEMONSTRATION, POSSESSION (DEALERS AND NON-DEALERS) AND COMMERCIAL BROADCAST RECEIVER LICENCES, ISSUED IN EACH POSTAL CIRCLE

Name of Postal Circle.		1938.												1939		
		Jan	Feb.	March.	April	May.	June	July.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	March
1 Bengal and Assam ..	Demonstration	24	21	20	20	7	33	33	34	12	25	30	18	34	33	33
	Possession ..	43	31	30	29	30	28	32	32	27	38	28	24	51	38	31
	C. B. R. ..	35	25	29	34	35	34	45	26	46	25	32	21	42	34	47
2. Bihar and Orissa	Demonstration	..	11	4	2	1	9	1	3	4	3	3	1	3	4	..
	Possession .	5	5	4	4	4	4	3	7	3	3	4	5	7	4	3
	C. B. R. ..	2	3	3	9	6	4	3	3	4	3	4	2	13	5	9
3. Bombay	Demonstration	37	30	13	7	20	21	48	32	22	15	43	54	52	28	32
	Possession ..	49	26	26	20	31	30	34	21	20	32	41	60	50	39	39
	C. B. R. ..	99	96	61	47	99	7	134	81	97	70	119	92	175	176	100
4. Central	Demonstration	7	8	5	5	5	6	5	5	8	6	10	4	12	6	6
	Possession ..	11	6	9	7	7	6	5	6	11	6	8	6	9	7	7
	C. B. R. ..	6	9	11	7	8	5	1	4	3	9	6	5	15	10	12
5. Madras	Demonstration	14	15	13	14	15	28	24	44	20	23	24	38	42	30	32
	Possession .	17	17	27	17	16	21	26	36	24	22	19	30	28	23	28
	C. B. R. ..	23	27	29	19	12	40	35	50	33	37	55	38	82	56	
6. Punjab and N. W. Frontier.	Demonstration	10	6	11	6	17	15	19	17	10	20	34	8	41	34	38
	Possession ..	54	21	34	24	24	29	21	26	21	30	27	29	51	32	34
	C. B. R. ..	32	30	30	29	20	39	26	41	31	32	21	29	53	62	52
7. Sind and Baluchistan	Demonstration	5	2	6	1	..	11	4	16	1	3	9	14	10	12	7
	Possession ..	6	7	7	3	10	5	6	18	1	5	4	8	11	6	6
	C. B. R. ..	16	11	15	12	16	21	8	12	17	6	11	13	38	11	21
8 United Provinces ..	Demonstration	9	10	8	6	4	28	19	1	13	13	28	20	20	23	11
	Possession ..	16	11	18	21	13	11	21	9	10	11	21	18	14	37	23
	C. B. R. ..	11	11	15	11	16	14	16	11	6	13	20	11	17	22	16
Total ..	Demonstration	106	93	80	61	69	151	153	152	90	108	181	157	214	170	159
	Possession .	201	124	155	125	135	134	151	155	117	147	152	180	221	186	171
	C. B. R. ..	224	212	193	168	212	162	268	228	237	195	268	211	435	376	314

APPENDIX XI.

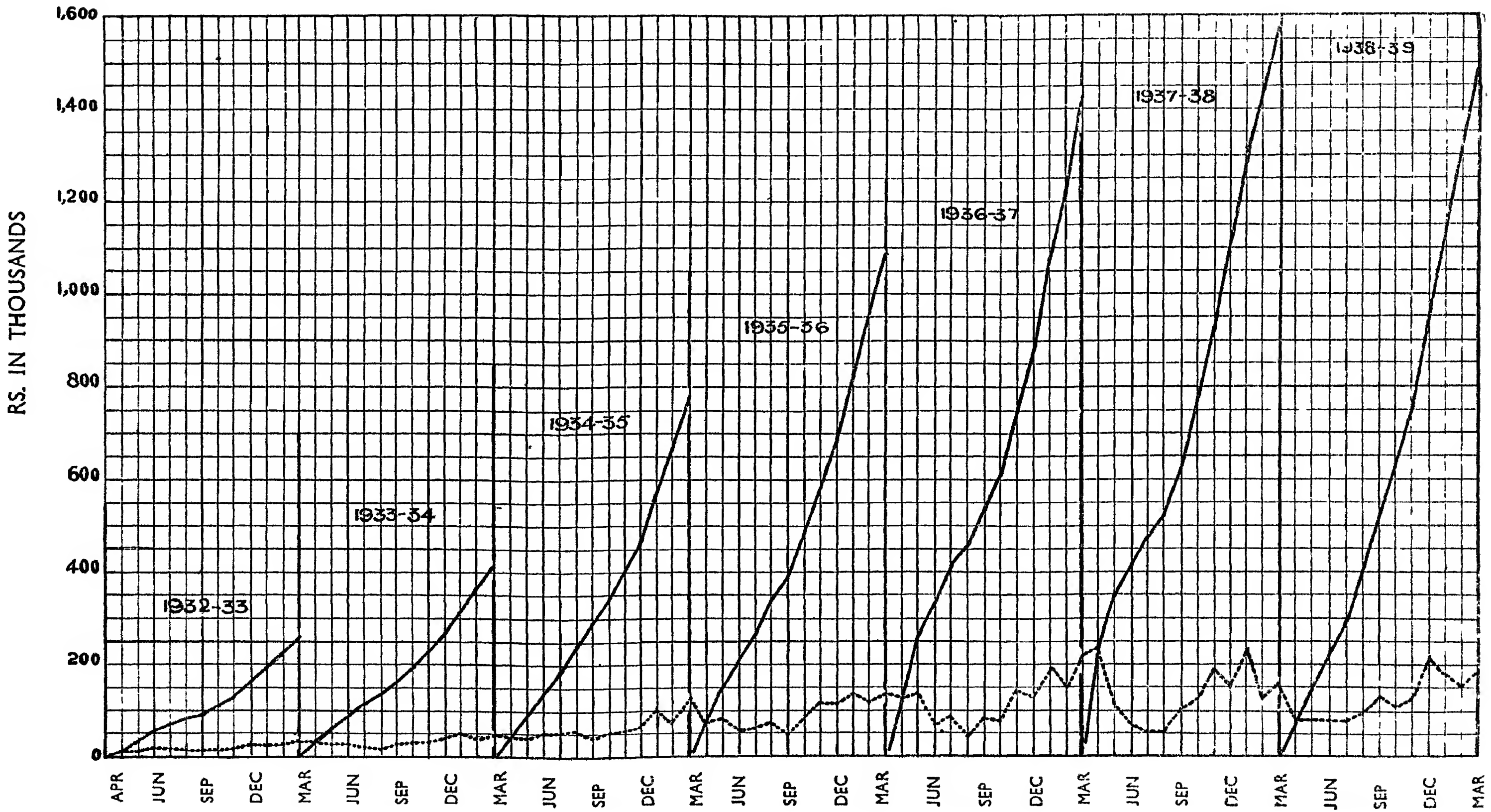
STATEMENT OF INDIAN CUSTOMS REVENUE.

(From Wireless Apparatus.)

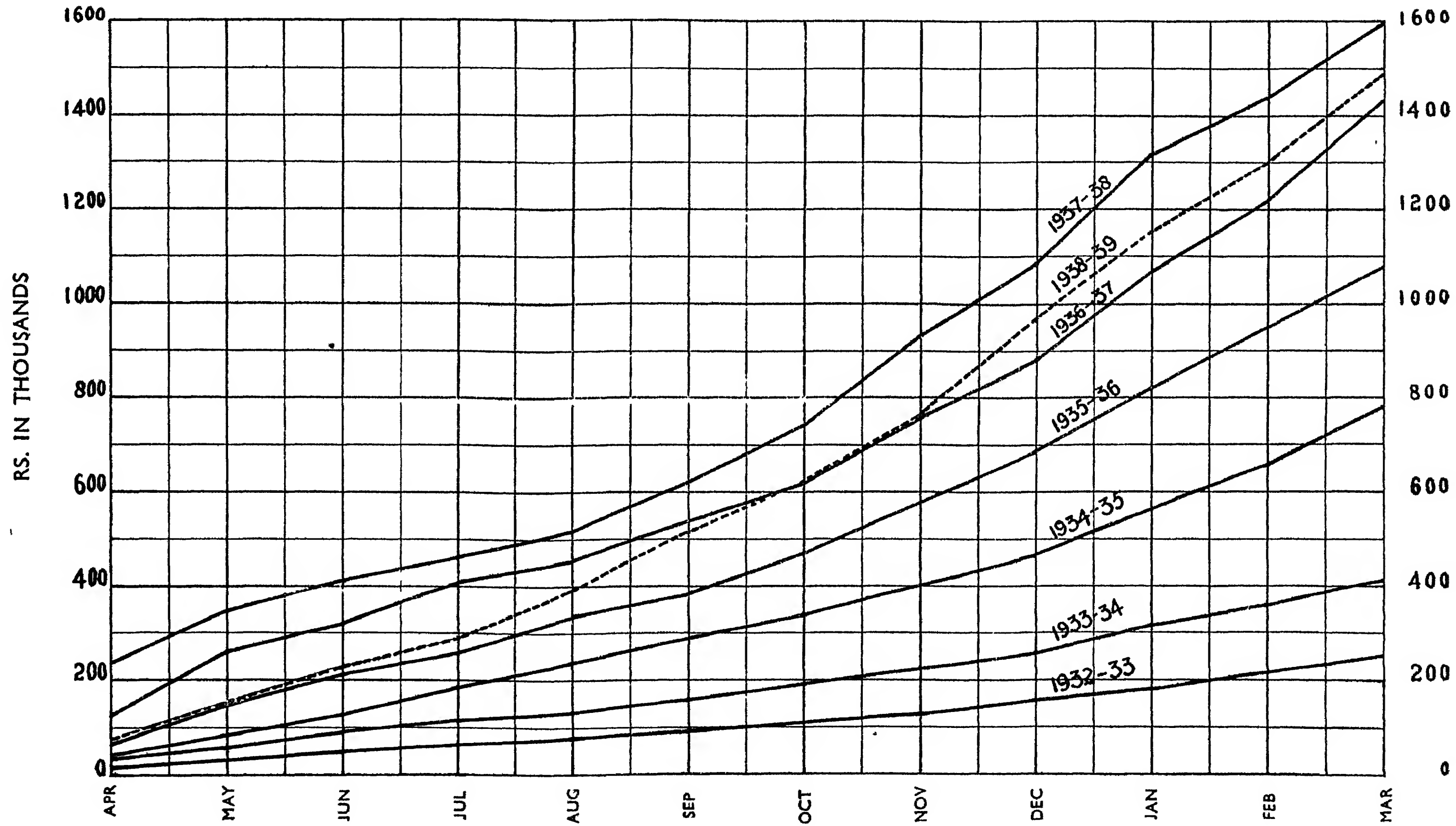
(In thousands of Rs.)

	1932-33.		1933-34.		1934-35.		1935-36		1936-37.		1937-38.		1938-39.	
	Month.	Total.	Month.	Total.	Month.	Total.	Month.	Total.	Month.	Total.	Month.	Total.	Month.	Total.
April	20	..	36	..	45	..	69	..	125	..	239		78	.
May	14	34	27	63	41	87	79	149	134	260	110	350	78	155
June	19	53	31	94	50	136	56	205	65	326	66	415	72	227
July	17	70	23	117	51	187	61	265	85	411	52	467	67	293
August ..	13	82	18	136	58	245	79	344	48	458	53	520	98	391
September ..	14	96	27	163	45	290	44	387	82	539	102	623	128	518
October ..	14	110	31	194	52	343	86	472	73	612	123	746	107	625
November ..	20	130	31	225	56	399	108	580	148	759	186	932	134	760
December ..	31	161	40	265	60	470	109	689	124	883	154	1,085	216	975
January ..	26	187	51	317	102	575	139	827	191	1,074	227	1,313	174	1,149
February .	31	218	45	363	71	658	123	949	149	1,223	126	1,438	153	1,301
March .	38	256	47	410	123	782	131	1,080	212	1,435	158	1,594	186	1,487

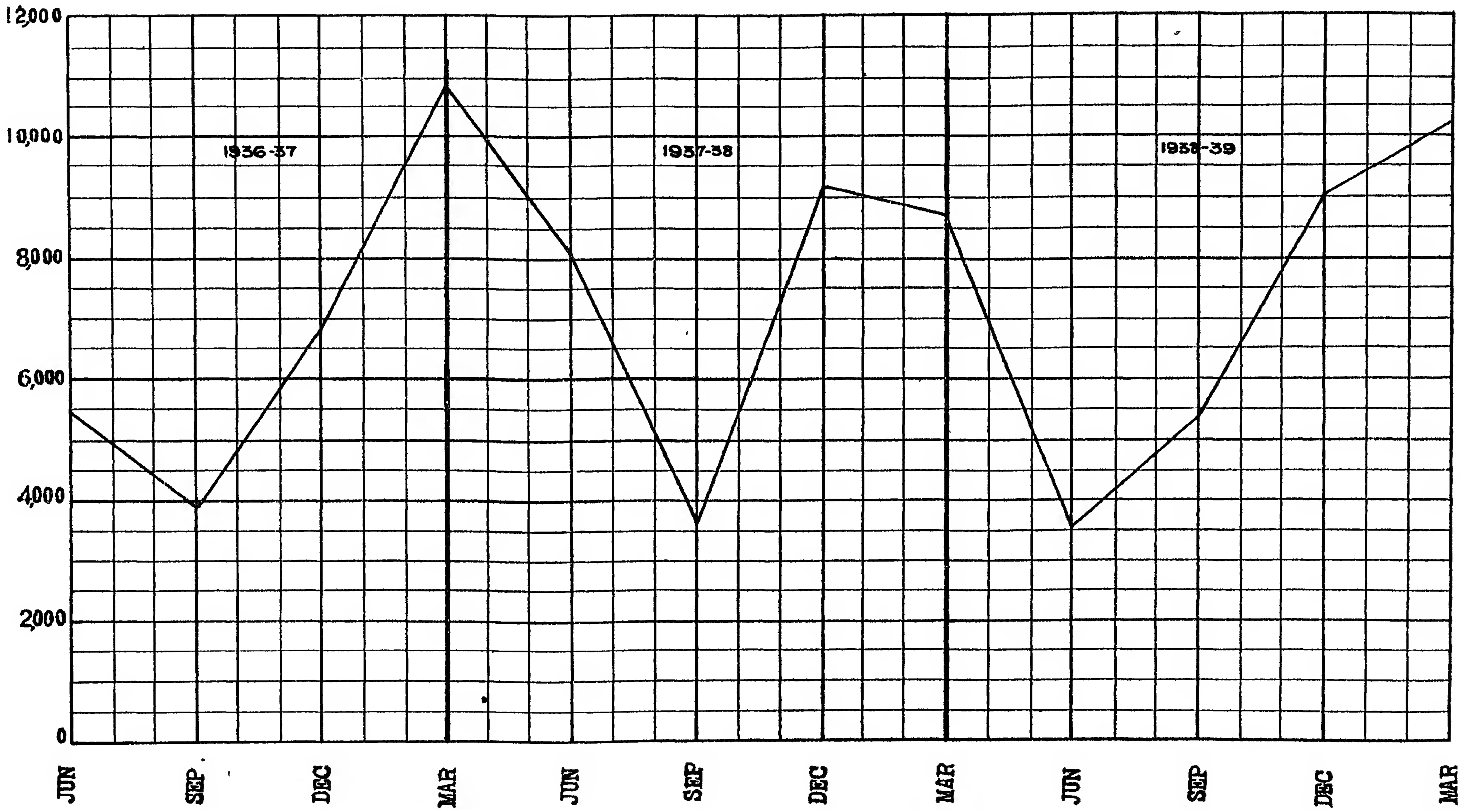
CUSTOMS REVENUE FROM WIRELESS APPARATUS (I)



CUSTOMS REVENUE FROM WIRELESS APPARATUS (II)



NUMBER OF RECEIVING SETS IMPORTED AT PORTS



APPENDIX XII.

STATEMENT SHOWING THE NUMBER OF BROADCAST RECEIVER SETS IMPORTED AT THE VARIOUS PORTS.

Quarter ending.	Ports.					Total for each Quarter.
	Madras.	Bombay.	Calcutta.	Karachi.	Rangoon.	
1936.						
June	271	3,140	1,228	653	139	5,431
September	83	1,736	838	1,015	171	3,843
December	190	4,341	1,063	942	267	6,803
1937.						
March	275	6,695	2,190	1,332	358	10,850
June	289	5,902	1,078	814	..*	8,083
September	81	2,227	932	401	..	3,641
December	465	5,769	1,861	1,053	..	9,148
1938.						
March	466	5,621	1,658	954	..	8,699
June	279	1,793	737	704	..	3,513
September	467	2,738	1,902	252	..	5,359
December	974	3,688	3,412	932	..	9,006
1939.						
March .. .	1,084	4,550	3,528	1,075	..	10,237

*With effect from the 1st April 1937 Burma ceased to be part of India.

APPENDIX XIII.

PROGRAMME TRANSMISSION HOURS (EXCLUDING TESTS).

Mediumwave.

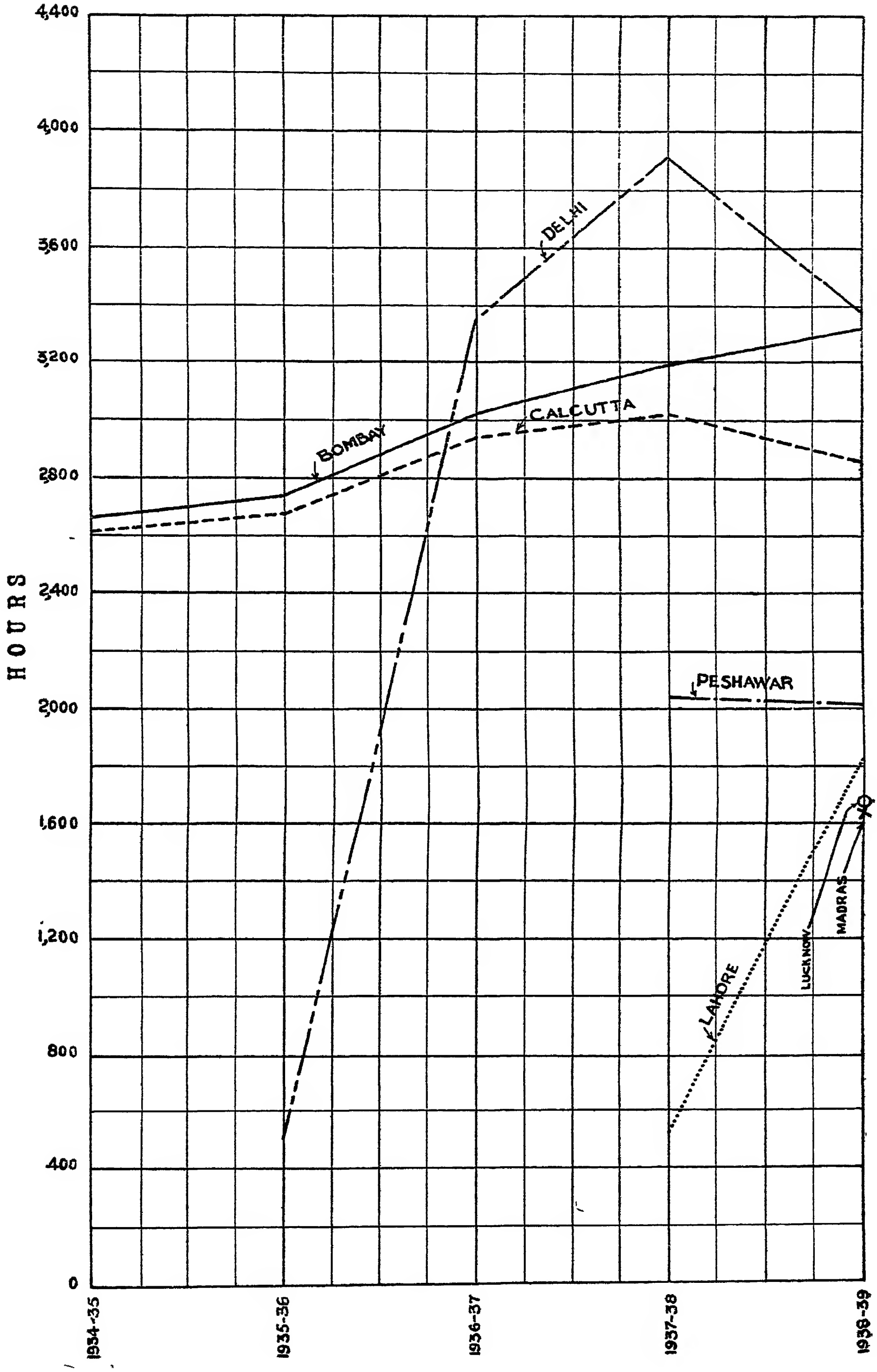
Year.	Delhi.	Bombay.	Calcutta.	Madras.	Lahore.	Lucknow.	Peshawar.
1934-35	..	2,667	2,609	..	..	..	..
1935-36	501	2,740	2,684	..	..	..	..
1936-37	3,346	3,024	2,941	..	..	..	..
1937-38	3,904	3,197	3,016	..	518	.	2,043
1938-39	3,380	3,312	2,850	1,644	1,824	1,654	2,006

Shortwave.

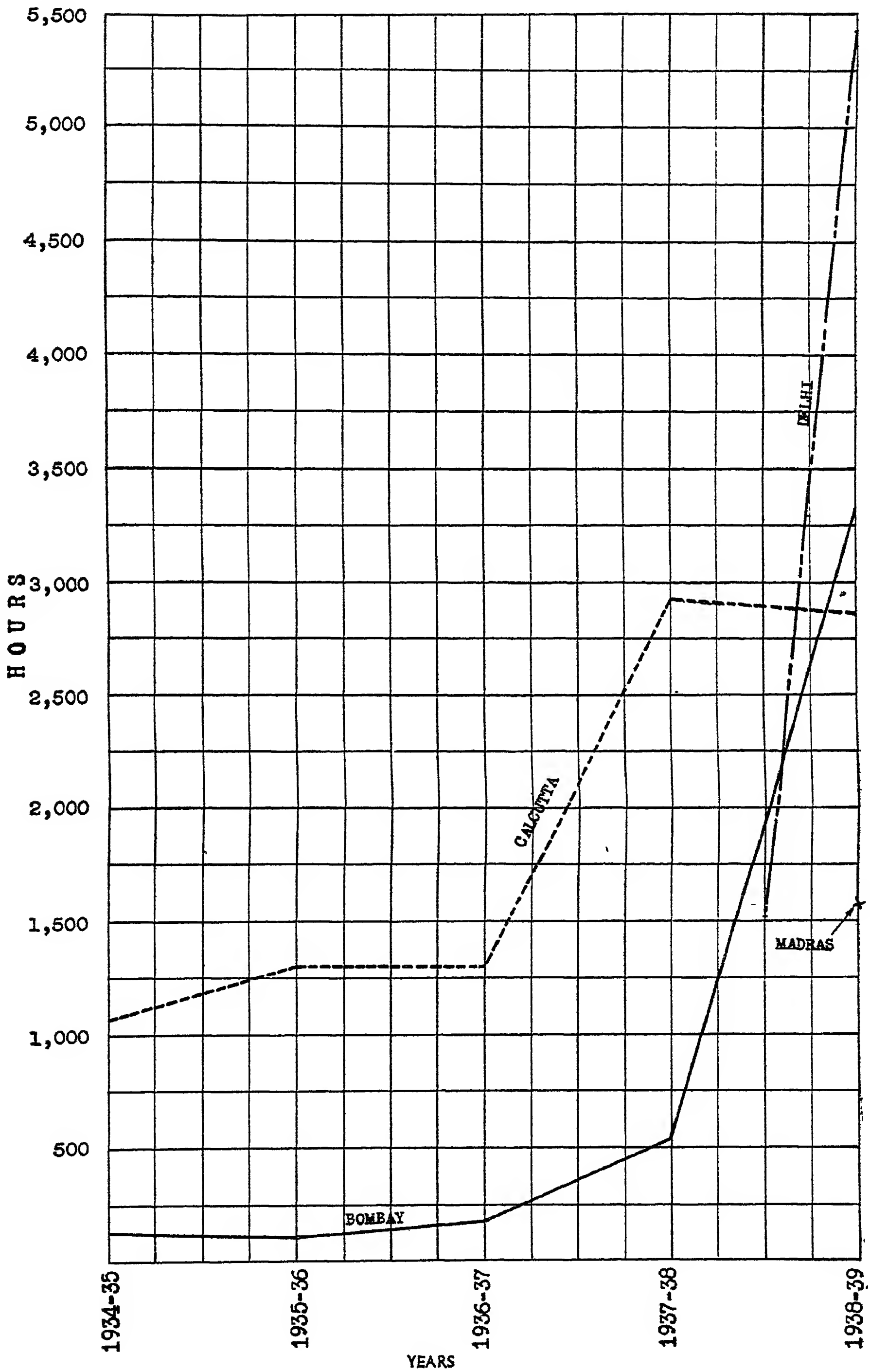
Year	Delhi.	Bombay.	Calcutta.	Madras.
1934-35	..	138	1,069	..
1935-36	..	105	1,305	..
1936-37	..	165	1,319	..
1937-38	1,538	538	2,913	..
1938-39	5,418	3,327	2,871	1,573

PROGRAMME TRANSMISSION HOURS

(MEDIUM WAVE)



PROGRAMME TRANSMISSION HOURS
(SHORT WAVE)



APPENDIX XIV.

ALL INDIA RADIO BROADCASTING SYSTEM AS ON 31st MARCH 1939.

(a) Mediumwave Stations.

Station.	Date of Opening.	Power in K.W.	Call Sign.	Frequency in Kc/s.	Wave length (Metres)	Transmission Time Indian Standard Time. (Subtract 5½ hours for G. M. T.)
Delhi	1st January 1936 .. .	20	VUD	886	338·6	(i) 0800 to 1000 (a) (ii) 1200 to 1400 (b) (iii) 1800 to 2300
Bombay	23rd July 1927	1 5	VUB	1,231	214	(i) 0800 to 0900 (ii) 1200 to 1400 (iii) 1530 to 1630 (c) (iv) 1800 to 2300
Calcutta	26th August 1927	1·5	VUC	810	370	(i) 0830 to 1230 (d) (ii) 1230 to 1430 (e) (iii) 1700 to 2230
Madras	16th June 1938	·25	VUM	1,420	211	(i) 1400 to 1430 (f) (ii) 1600 to 1630 (g) (iii) 1700 to 2230
Lahore	16th December 1937 ..	5	VUL	1,086	276	1800 to 2300
Lucknow	2nd April 1938 .. .	5	VUW	1,022	293 5	1800 to 2300
Peshawar	1st April 1937 .. .	·25	VUP	1,500	200	1900 to 2300
Under Construction.						
Trichinopoly	....	5	VUT	758	395·8	
Dacca	....	5	VUY	1,167	257·1	

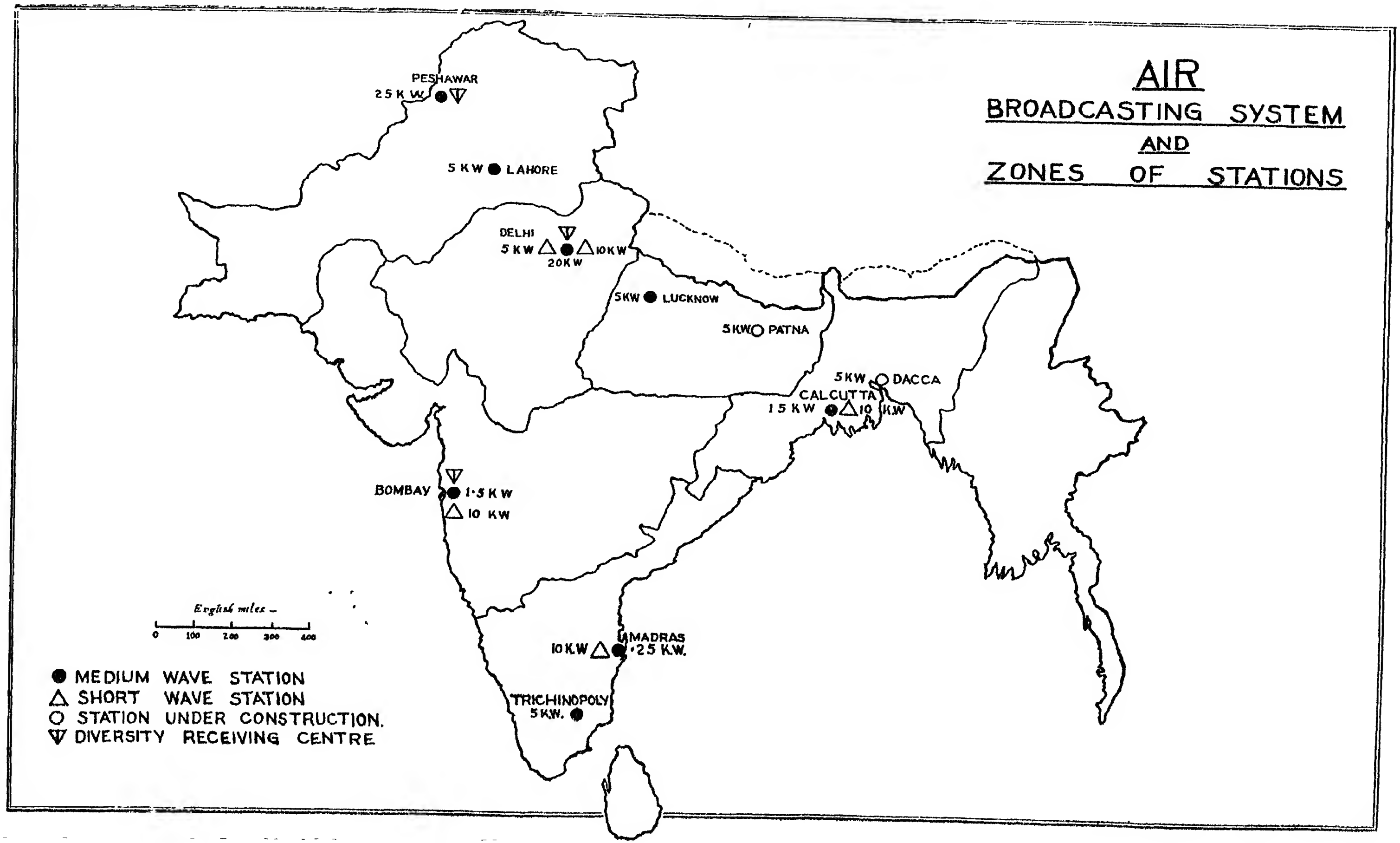
(a) Except on Wednesdays (0800 to 0910).
(b) On Mondays and Saturdays 1200 to 1445. On Thursdays 1200 to 1420.
(c) Except on Saturdays.
(d) Sundays only.
(e) Except on Sundays.
(f) Mondays, Wednesdays and Fridays only.
(g) Weekdays only (except Saturdays and Sundays).

ALL INDIA RADIO BROADCASTING SYSTEM AS ON 31ST MARCH 1939.

(b) Shortwave Stations.

Station.	Date of Opening.	Power in K. W.	Call Sign.	Frequency in Kc/s.	Wave-length (Metres).	Transmission Time. Indian Standard Time. (Subtract 5½ hours for G. M. T.)
Delhi II	16th December 1937 .	10	VUD 2	9,590 4,960	31 3 60·48	(*i*) 0800 to 1000 (*a*) (*ii*) 1200 to 1400 (*b*) (*iii*) 1800 to 2300
Delhi III	1st June 1938	5	VUD 3	15,290 9,590	19·62 31·3	(*i*) 0800 to 1000 (*a*) (*ii*) 1200 to 1400 (*b*) (*iii*) 1800 to 2300
Bombay II	4th February 1938 ..	10	VUB 2	9,550 4,880	31·4 61 48	(*i*) 0800 to 0900 (*ii*) 1230 to 1400 (*iii*) 1530 to 1630 (*c*) (*iv*) 1800 to 2300
Calcutta II	16th August 1938	10	VUC 2	9,530 4,840	31·48 61·98	(*i*) 0830 to 1230 (*d*) (*ii*) 1230 to 1430 (*e*) (*iii*) 1700 to 2230
Madras II	16th June 1938	10	VUM 2	11,870 4,920	25·28 60·98	(*i*) 1400 to 1430 (*f*) (*ii*) 1700 to 2230

(*a*) Except on Wednesdays (0800 to 0910).
(*b*) On Mondays and Saturdays 1200 to 1445. On Thursdays 1200 to 1420
(*c*) Except on Saturdays.
(*d*) Sundays only.
(*e*) Except on Sundays.
(*f*) Mondays, Wednesdays and Fridays only.


AIR
BROADCASTING SYSTEM
AND
ZONES OF STATIONS
PESHAWAR
25 K W
5 K W LAHORE
DELHI
5 K W
20 K W
10 K W
5KW LUCKNOW
5KW PATNA
5 KW DACCA
CALCUTTA
15 K W
10 KW
BOMBAY
1·5 K W
10 KW
MADRAS
10 K.W
·25 K.W.
TRICHINOPOLY
5 K.W.
English miles
0
100
200
300
400
MEDIUM WAVE STATION
SHORT WAVE STATION
STATION UNDER CONSTRUCTION.
DIVERSITY RECEIVING CENTRE

ALL INDIA RADIO BROADCASTING SYSTEM AS ON 31ST MARCH 1939—*contd.*

(c) ALL INDIA RADIO RECEIVING CENTRES.

Place.	*Date on which it came into operation*
1. Delhi (Todapur)	12th May 1937.
2. Bombay (Bamanpuri)	7th January 1939.
3. Calcutta (Jadevpur)	*
4. Madras (Tiruvottiyur)	28th December 1939.
5. Lahore	*
6. Lucknow	*
7. Peshawar	1st March 1939.
8. Trichinopoly (Tiruverambur)	3rd September 1939.
9. Dacca	*

*A permanent Receiving Centre has not yet been provided. At Calcutta and Dacca temporary Receiving Centres are in operation at present.

APPENDIX XV.

NUMBER OF STUDIOS.

Bombay	5	No. 1.—European Music.	
		No. 2.—Indian Music.	
		No. 3.—Talks, News and Records.	
		No. 4.—English Talks.	
		No. 5.—Drama and Indian Music.	
Calcutta	6	No. 1.—European Music.	Under construction.
		No. 2.—Drama.	
		No 3.—Talks, News and Records.	
		No. 4.—Indian Music.	
		No. 5.—Feature Programmes and Drama.	
		No. 6.—Talks, News and Records.	
Delhi	5	No. 1.—News and Records.	Under modification.
		No. 2.—Indian Music and Drama.	
		No 3.—Indian Music.	
		No. 4.—European Music.	
		No. 5.—Talks.	
Lahore	5	No. 1.—European Music.	
		No. 2.—Indian Music.	
		No. 3.—Drama.	
		No. 4.—Talks.	
		No. 5.—News and Records.	
Lucknow	4	No. 1.—European Music.	
		No. 2.—Indian Music.	
		No. 3.—Talks.	
		No. 4.—News and Records.	
Madras	4	No. 1.—European Music.	
		No. 2.—Indian Music.	
		No. 3.—Drama.	
		No. 4.—Talks, News and Records.	
Peshawar	1	Talks, Music and Drama.	

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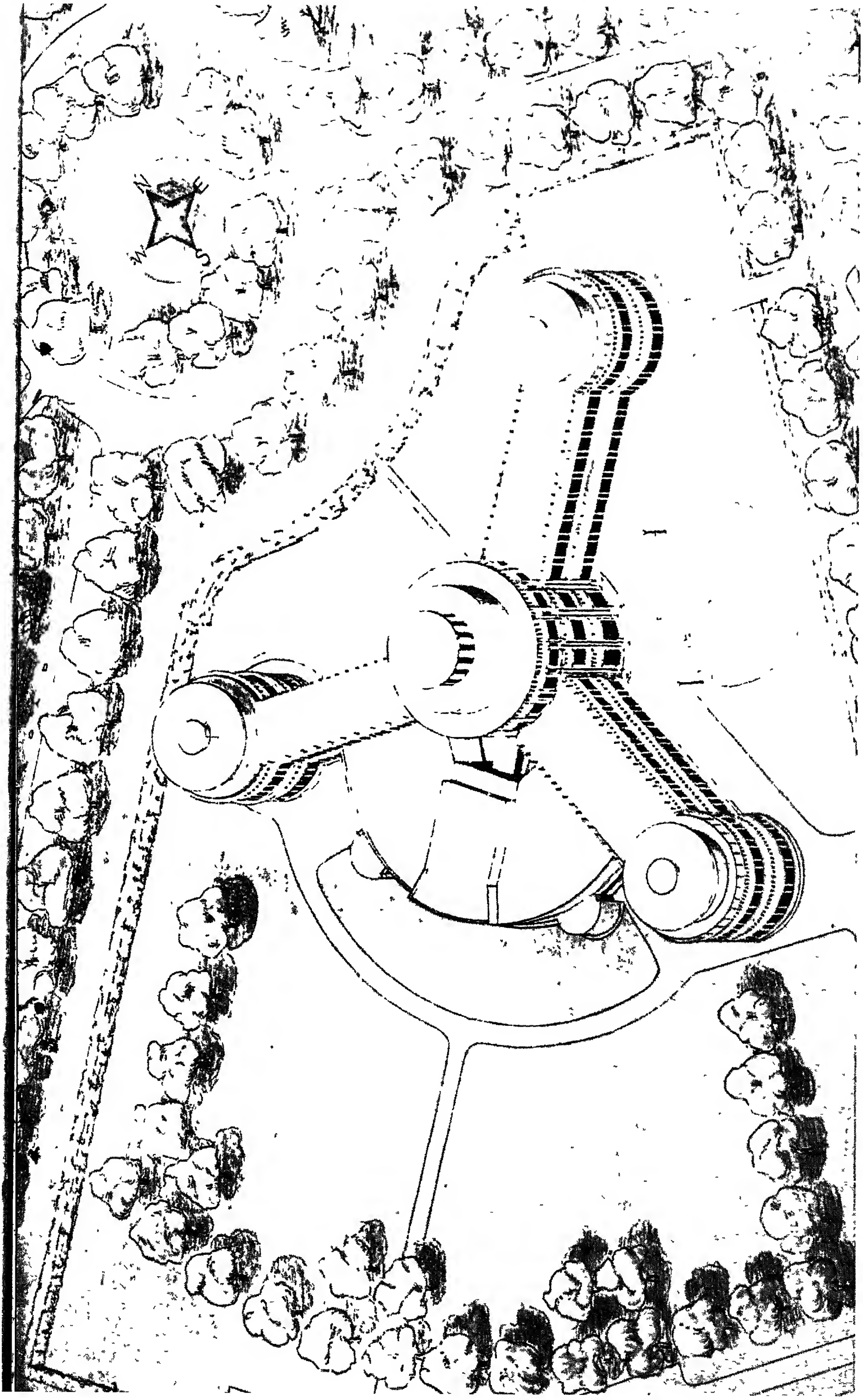

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N—*contd.*

P—*contd.*

Q

R

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S

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